

# THE IRON AGE

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## Time Saved on Multiplicity of Parts

Mechanical Handling in Plating Department of Cash  
Register Plant More Than Doubles  
Turnover of Material

BY BURNHAM FINNEY\*

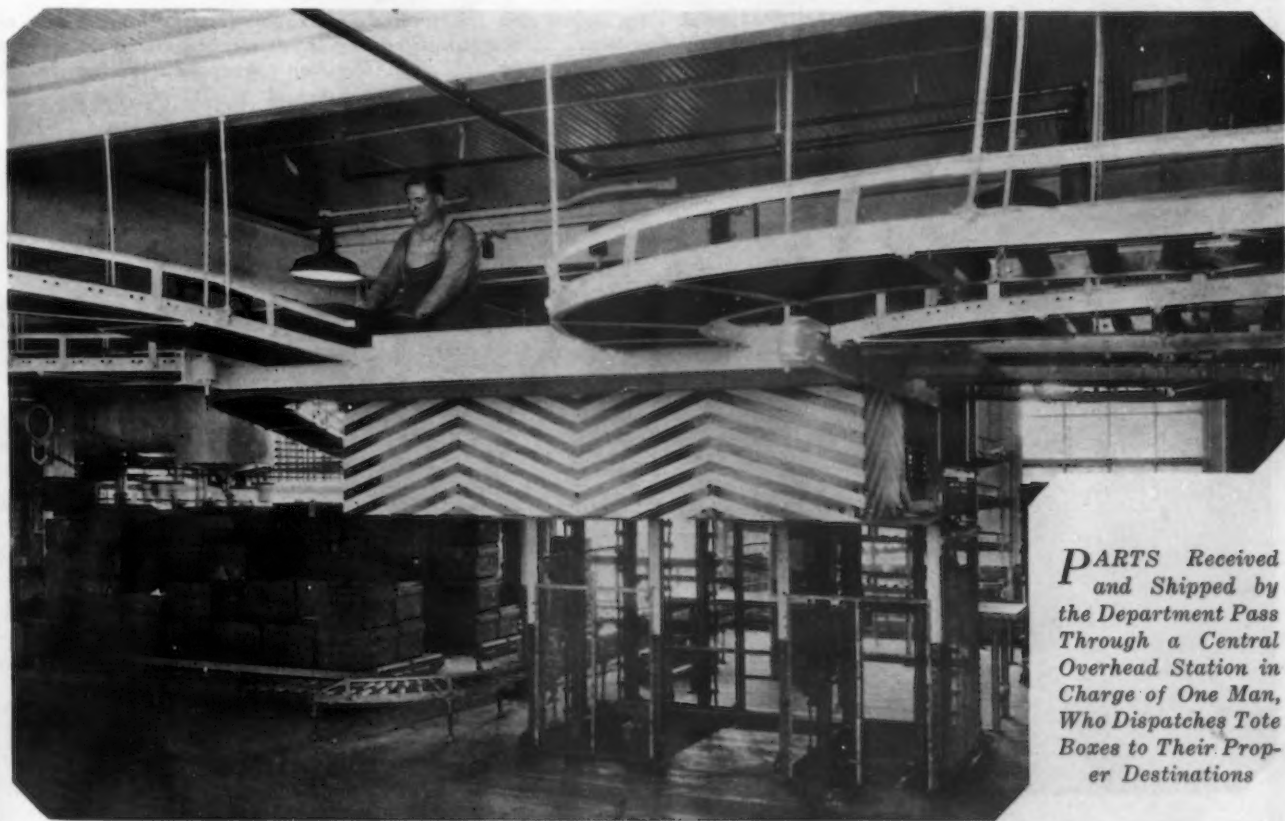
**W**HEN a product is made up of many small parts, one of the puzzling problems for the manufacturer to work out is the most economical means of handling the units within and between various departments. When the number of parts totals 42,000, as it does in the plant of the National Cash Register Co., Dayton, Ohio, the problem becomes far more difficult than in the average metal-working factory. Furthermore, success in keeping down costs necessarily depends upon the efforts exerted in that direction by each individual department, if the plant

in its entirety is to benefit to the greatest possible degree.

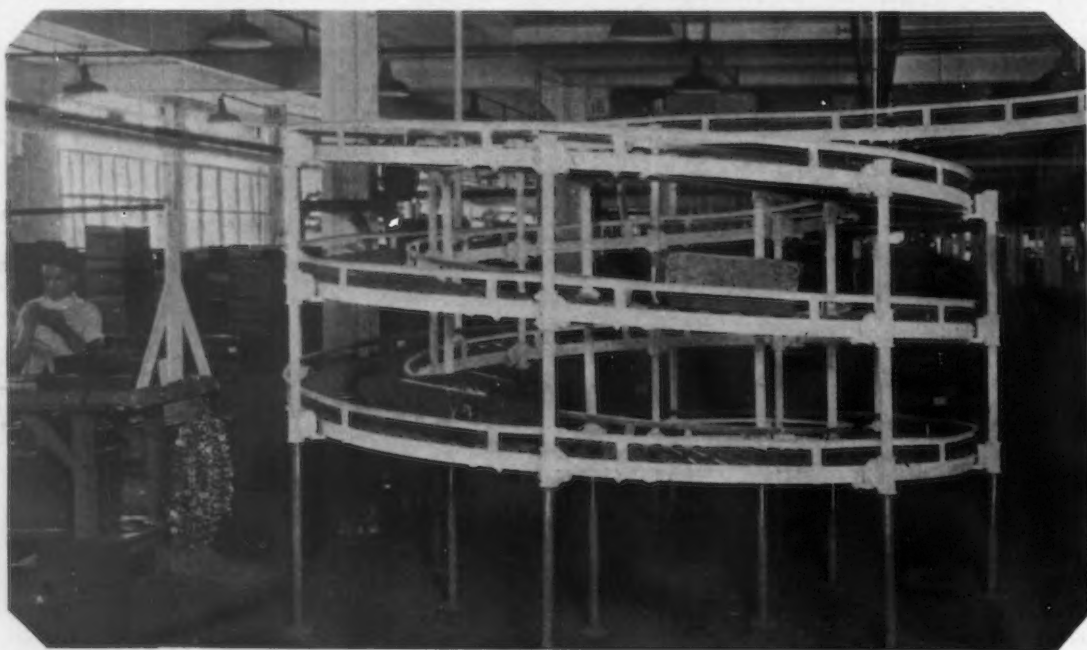
Recently attention has been centered on solving most efficiently the mechanical handling problem in plating departments, and in this direction the National Cash Register Co. has been able to make a substantial saving. The greatest expense in manufacturing is said to be the time material is idle between operations. In cutting down this idle time about 60 per cent, a distinct advance over previous handling methods has been made in the plating department.

In the process of making cash registers more than 32,000 individual parts pass through the plating department. Many of the parts cannot be scheduled for plating at stated inter-

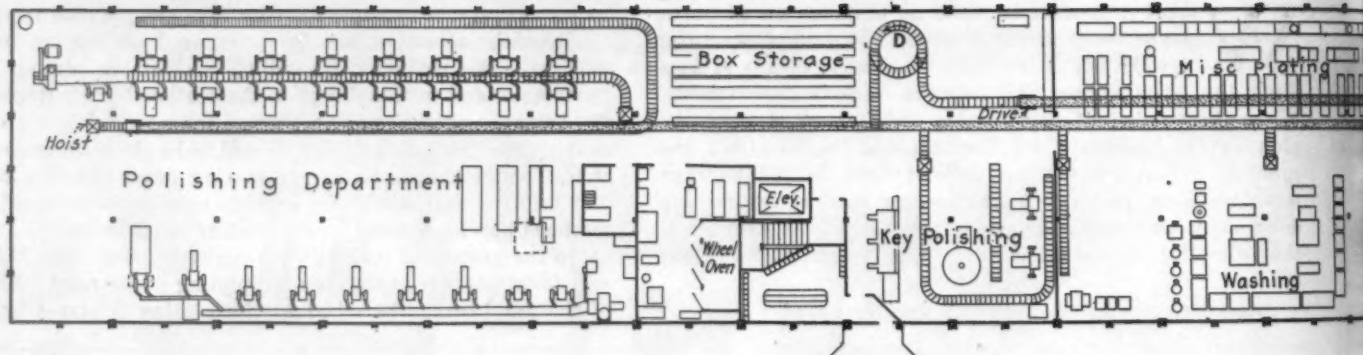
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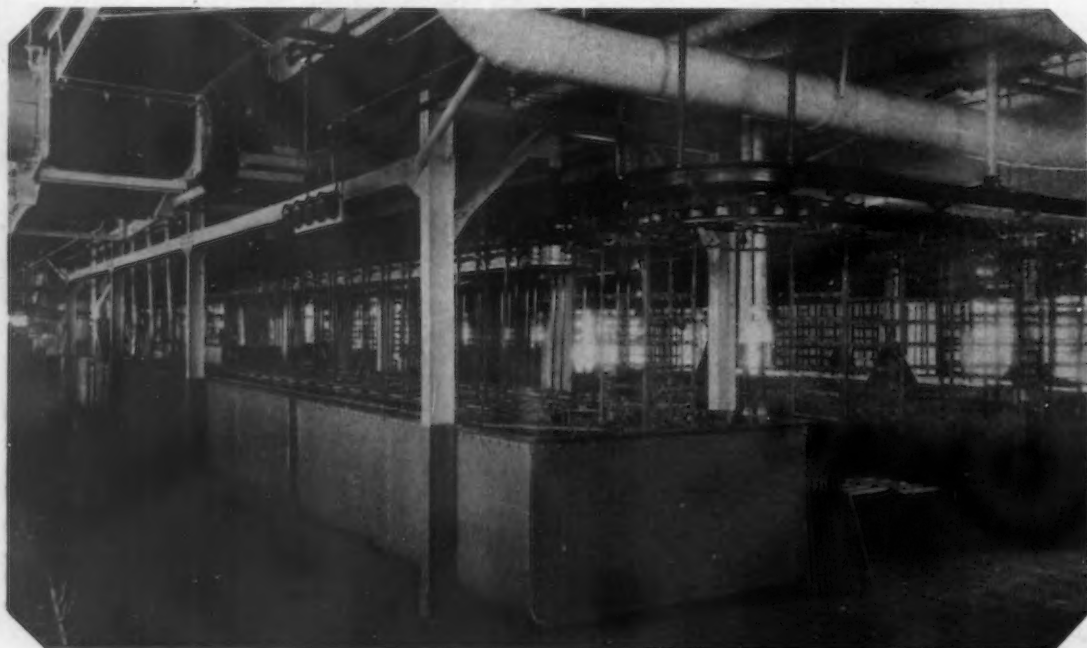
***PARTS** Received and Shipped by the Department Pass Through a Central Overhead Station in Charge of One Man, Who Dispatches Tote Boxes to Their Proper Destinations*



FROM Belt and Roller Conveyors Spurs Lead to Spiral Roller Conveyors, Down Which Material Passes to Point Where It Is to Be Used. B on plan is an example



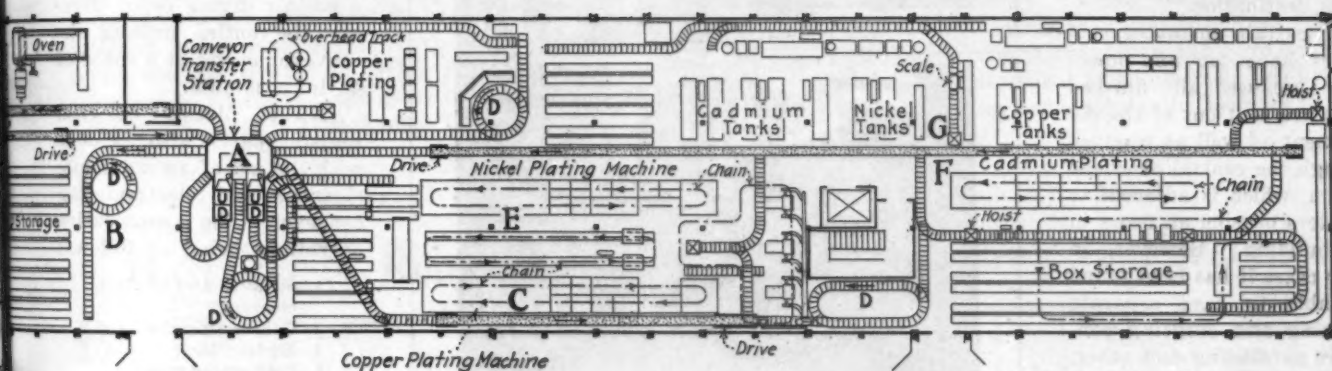
FROM Transfer Station A Tote Boxes Are Dispatched to Proper Destinations. B is one of several operators. D represents a downward movement. Cleaning and electroplating conveyors are at E on plan. All roller conveyors are shown with lines



AUTOMATIC Cleaning and Electroplating Conveyors for Nickel and Copper Plating Parallel Each Other and Are Closely Connected by Overhead Conveyor. These are shown at E on plan

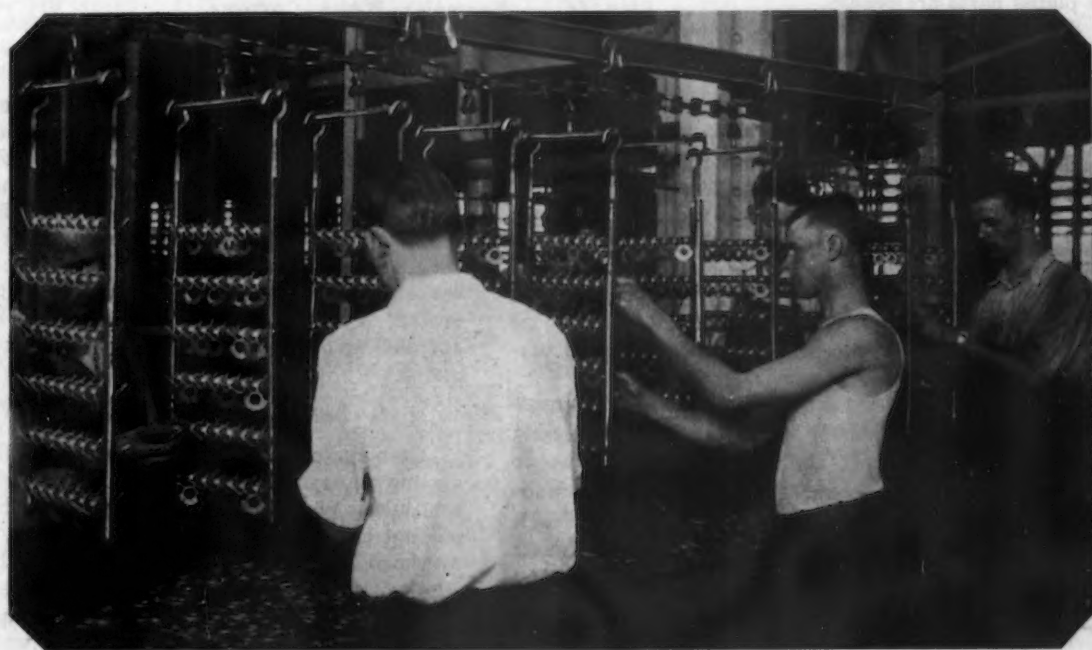


**COPPER** Plating and Nickel Plating Operations on Cash Register Keys Are Closely Linked with Buffing by Overhead Conveying System (C on Plan). Movement of keys past buffing machines is timed to conform to needs of operators



conveyors leading down to floor below. At C is copper plating machine delivering to buffing  
 nickel plating racks are loaded at F. G is one of several small hoists marked with crossed lines.  
 like a railroad track; belts are stippled

**PARTS** to Be Cadmium Plated Are Racked by Hand Ready for Passage to Automatic Cleaning and Electroplating Conveyor (F on Plan). Some racks hold 42 parts, others double that number



vals, further complicating the problem of arranging equipment to the best possible advantage. The manner in which the company has met this situation is detailed in this article.

#### Overhead Conveyors Save Floor Space

To conserve space and to use most profitably the present quarters occupied by the department, roller and belt conveyors have been installed overhead. All material received comes in through a central overhead receiving station, in charge of one man, from which gravity conveyors go out to the various stations. Wherever the carrying out of the system of gravity conveyors would interfere with the headroom needed by workmen, because of the necessary downward slope, a combination of gravity and belt conveyors has been used. The gravity type extend from the central station to the point where the desired minimum height above the floor is reached; there the conveyor deposits material on a belt conveyor which takes it to its destination.

In certain instances conveyors have top and lower runs because all finished parts are sent out of the department as well as received through the central overhead station, which is adjacent to elevators passing all floors in the building. However, in other cases it has been found desirable to have separate incoming and outgoing conveyors paralleling each other. From the conveyors, branch spurs lead to spiral roller conveyors, down which the material passes to the station where it is to be used. When plated parts are ready to be dispatched to the next operation, they are placed on a small vertical elevator which carries the material upward to a roller conveyor just under the ceiling, which passes it to the central station.

All parts are transported in tote boxes. When the dispatcher at the central overhead station receives a box, he looks at the route card accompanying it and shunts the material to the station to which it must go. He follows the same procedure when plated parts arrive at the station, the tote boxes being deposited by him on the elevator to go to the department where the next operation is to be performed.

Cadmium plating of parts is done automatically by means of a cleaning and electroplating conveyor, which is closely linked with a sprocket and chain overhead conveyor on which cash register parts are racked. Standard racks made of brass and steel, covered with rubber, hold 42 parts each, although some racks have double that capacity. Parts are taken from tote boxes and put on a table by workmen. From the table the parts are placed by hand on the racks, which, when filled, are suspended by hooks from the overhead conveyor. This conveyor bounds a rectangular space in which the tote boxes are stored.

Loaded racks move along the conveyor to the point where the cadmium plating process begins. There they are transferred to the plating conveyor by hand. After passing through the plating process, which returns them to the position from which they started, the plated parts are removed from the racks and are placed in tote boxes by the same workman who started them on their journey. The empty racks then are put on the overhead sprocket and chain conveyor, which carries them again to the workmen at the loading station.

Cadmium plating consists of nine operations. Parts first are dipped in a potash soaking and cleaning bath for a period of 7 min. and then pass through an electric cleaner and cold water rinse. Next they are submerged in a hydrochloric pickle dip for 2½ min., after which they go through two cold water rinses. The parts then are submerged in the cadmium plating bath for 6 min. This is followed by a cold water rinse, a hot water rinse and passage for 6 min. through a hot air drying oven. During the entire process the conveyor moves at a speed of 48 in. a minute.

Nickel plating of cash register parts, also, is done with the aid of an automatic cleaning and electroplating conveyor, the consecutive operations being as follows:

1. Soaking and electric cleaning.
2. Cold water rinse.
3. Hydrochloric pickle.
4. Cold water rinse.
5. Cyanide dip (hooded).
6. Cold water rinse.
7. Cold water rinse.
8. Nickel plating (42½ min.).
9. Cold water rinse.
10. Hot water rinse (hooded).
11. Hot air drying oven (6 min.).

With the exception of the fact that there are no electric cleaning and no cyanide dip, the process used in copper plating parts is similar to that of nickel plating.

Each automatic plating machine is equipped with a 3-hp. motor and a 6-volt, 2500-amp. generator, electrically driven for the plating tank, while the electric cleaning solutions collectively are taken care of by a 12-volt, 5000-amp. generator. Power for the operation of the belt conveyors is supplied by one 5-hp. motor, two 3-hp. motors and one 1-hp. motor.

#### Keys Are the Main "Production" Item

Cash register keys are the only part that comes to the plating department regularly and for which a definite daily schedule is planned. Keys are racked by hand, in the same manner as the parts for cadmium plating, and move by an overhead chain and sprocket conveyor to the copper plating conveyor, to which the racks are transferred. After the keys are copper plated, the racks are transferred back to the overhead sprocket chain conveyor, which carries them a short distance to buffing machines to be copper buffed. Here the movement of the racks is timed to conform with



*PLATED Parts to Be Dispatched to Next Operation Are Placed on a Small Elevator (G on Plan Is an Example) Which Carries Material Upward to Conveyor, Along Which It Moves to Central Station*



the needs of the machine operators. Each workman who removes a rack from the conveyor buffs all of the keys on the rack before returning it to the conveyor.

From this point the racks of keys go on the conveyor to the nickel plating machine, where the handling process is the same as that in connection with copper plating. After being nickel plated, the keys, still on the racks, go again to the buffing operators, who nickel buff them and deposit them in tote boxes. When the tote boxes are filled, they are lifted by hand on to the vertical elevator nearby, which carries them to the overhead belt conveyor for passage to the overhead central station and thence out of the department.

All small parts, except those which are to be nickel plated, are lacquered. They are racked by a workman who then dips the rack in a pot of lacquer. He suspends the rack on a cross bar over the pot to let the excess lacquer drip off, after which he puts the rack on a cross bar in a gas baking oven designed and built by the Detroit Sheet Metal Works, Detroit. The rack containing the parts normally completes a revolution in the oven in 15 min., although the speed can be changed to meet varying conditions. The oven has a temperature range from 130 to 450 deg. Fahr., to handle either lacquered or japanned work.

On a large number of parts entering the manufacture of cash registers, it is often found convenient and necessary to localize the carbonizing and hardening on certain mechanisms: (1) where the part must be strong and ductile to withstand shocks; (2) where machining operations must be performed after the part is hardened; (3) where deformation or warping of the part is likely to take place during the heat treatment. When large quantities of small parts are to be treated, the most convenient and least expensive method is to copper plate them in bulk, to prevent

carburizing of the parts where such a process is not needed. Such parts are copper plated in horizontal plating barrels. Since the average carbonization is 0.020 in., a minimum thickness of copper of 0.0005 in. is required. However, the thickness of copper varies to some extent according to the depth of the carbonization required. After being copper plated, the parts are machined at the points where they are to be hardened.

For localized carbonizing and hardening, barrel-plated copper has been found to be superior to still tank plating. The success of this method of plating is attributed to the dense, compact plate obtained by the burnishing effect of the parts rolling over each other in the barrel.

#### Work in Process Reduced 60 Per Cent

While the new system of handling parts in connection with the cadmium, copper and nickel plating has been in operation only a few weeks, its merits already are manifest. The time of the work in process has been reduced 60 per cent, or—to put the results in another way—the turnover of material in the department has been more than doubled. By utilizing what was heretofore waste space overhead for the movement of materials, the department has been able to increase its output, even though utilizing a smaller working area. In addition, the necessity for handling parts by hand, except for racking and unracking, has been virtually eliminated and labor costs have thereby been reduced.

In thus revamping the plating departments, the company has proceeded one step beyond the earlier changes in handling its enameling work. These were described in *THE IRON AGE* of June 14, page 1672. Attention was there directed to the elimination of congestion, the more uniform results obtained with decreased handling, reduction by 80 per cent in stock in process and a substantial increase in output.

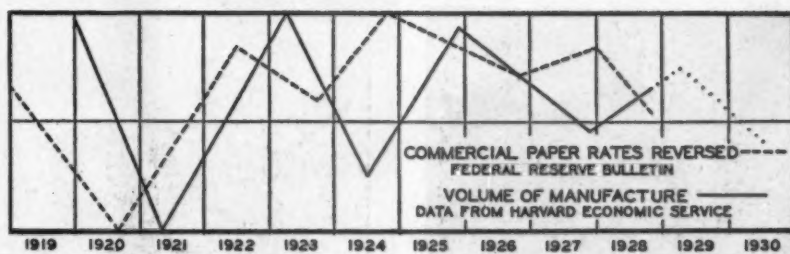
## Business to Reach Peak in 1929, According to Forecaster

**B**USINESS will continue to expand until it reaches a peak in 1929, according to the long-time forecaster of the Simonds Saw & Steel Co., Fitchburg, Mass. Discussing this forecast in the Nov. 1

issue of *Looking Ahead*, Alvan T. Simonds, president of the company, says in part:

In May, 1926, speaking before the financial section of the American Management Association, my assistant, John G. Thompson, basing his forecast upon the accompanying chart, which is our long-time forecaster, declared that business had reached its peak in the spring of 1926 and would decline in its general movement until the latter part of 1927, and then revive through 1928 to its next peak in 1929. Up to date this forecast is correct. It may be found in the printed report of the meeting. He now declares that business is moving to its next peak in 1929, from which it will decline in its general movement until about the middle of 1930, according to how long commercial money rates continue their present general upward movement. He is again basing his forecast upon the chart above. This chart is prepared simply to show trend and that one line moves up and down similarly to the other. No attempt is made to decide upon and show a normal for either line.

I am not going to forecast. I ask each reader of *Looking Ahead* to study the chart for himself. The long dot line represents major movements in interest rates on prime commercial paper in New York as reported in the *Federal Reserve Bulletin*; the solid line represents major movements in the volume of manufacture, as reported by the Harvard



Economic Service; the round dot line represents approximately the line that the volume of manufacture will follow in the immediate future if the sequences shown by the chart up to date are to continue, i.e., if increas-

ing money rates are to be followed as they have since 1919 by declining volume of manufacture.

The chart shows three downward movements in money rates (remember money rates are reversed on the chart) followed by three upward movements in the volume of manufacture. Today we are in the third of these upward movements in the volume of manufacture, following the downward movement in money rates from November, 1926, to January, 1928. The chart also shows four upward movements in money rates. The first three of these are followed by downward movements in the volume of manufacture. Will the fourth, as shown on the chart from January, 1928, to date, be followed by a downward movement in the volume of manufacture as shown by the round dot line on the chart? The chart shows the facts as found by two reliable reporters of business conditions. Decide for yourself whether the immediate future is to be like the past since the war in the correlation of movements in money rates with movements in business. Certain it is that credit in the United States is in an unhealthy condition. We have lost nearly a half billion of our gold reserves, and at the same time a mania for speculation, based largely upon credit, has developed. In some way or other, sooner or later, we shall have to pay for our spree.

# Mass Production Welding Operations

Oblique Welder Prevents Surface Markings—Flash Welder Eliminates Hand Labor—Portable Welders Simplify Jigs—Trolley Conveyor Guarantees Steady Production

BY JOSEPH W. MEADOWCROFT\*

**A** COMPARISON of the various methods used on all-steel automobile bodies (a manufacture designed with welding as its main operation) shows that the following changes have taken place from 1914 to 1928. Arc welds on each assembled body have decreased from 5 to 1 per cent; oxy-acetylene welds have decreased from 48 to 30 per cent; spot and flash welds have increased from 47 to 69 per cent. The reduction in arc welds is due to the change of methods. For instance, the outside door panel was tacked to the assembled inside frame of an all-steel door, but the arc "tacks" required filing off metal at points of contact, this building up being due to the continuous striking of a new arc.

Fig. 1 shows a machine developed especially for this operation. The entire inner panel is energized while the single die makes the weld. This machine, known as the oblique spot welder, due to its indirect means of welding, is designed and built in our own plant. The transformer is of Budd split type, only four bolts need to be loosened to remove the coils. The strands for energizing the inside

panel are of sufficient size to carry the ampere load, and of sufficient flexibility and properly counterweighted to permit the entire welding of the door with one handling. The work is shown in Fig. 2, exactly as it comes from the machine. At the left is the inside, showing spot welds; at the right is shown the clean surface of the outside panel.

Flash welding has been applied in recent years for making long seams in sheets. Fig. 3 shows a machine of standard design, used for flash welding of all two-piece cowls of earlier design, and all roof panel joints in the newer closed bodies. Between the clamps can be seen a roof panel in horizontal position and a quarter panel standing upright. The machine takes 125 kw., is power driven, and fully automatic.

Fig. 4 shows the interior view of the machine used to flash weld the seams of a tonneau. It is also of standard design, equipped with a Budd sizing fixture, and has two individual welding units mounted on one bed plate. Each unit is equipped with one 200-kw. welding transformer, has

\*Assistant Works Manager, Edward G. Budd Mfg. Co., Philadelphia. Extracts from an address before the American Welding Society, Oct. 9.

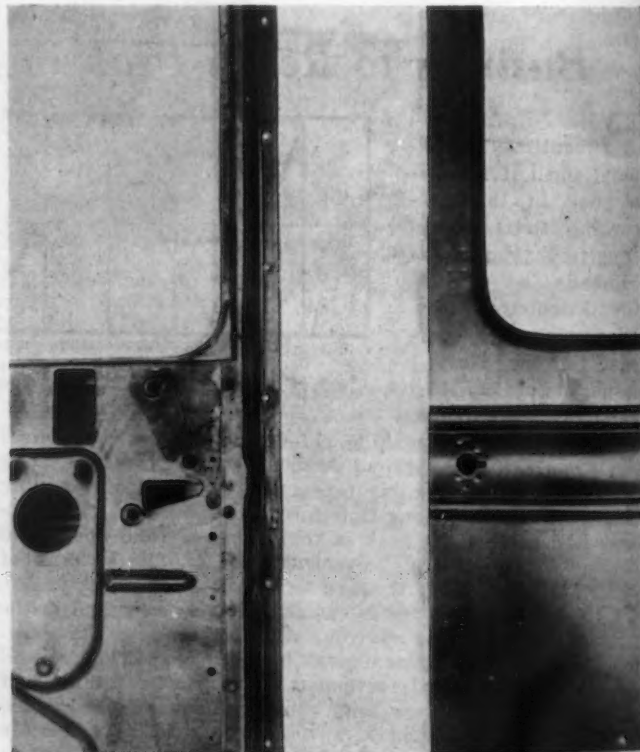


Fig. 1 (at Left)—Oblique Welder. When current comes in through upper electrode it makes a spot weld on flange and flows out through terminal clamped to inner frame. Lower die is insulated and carries away no current

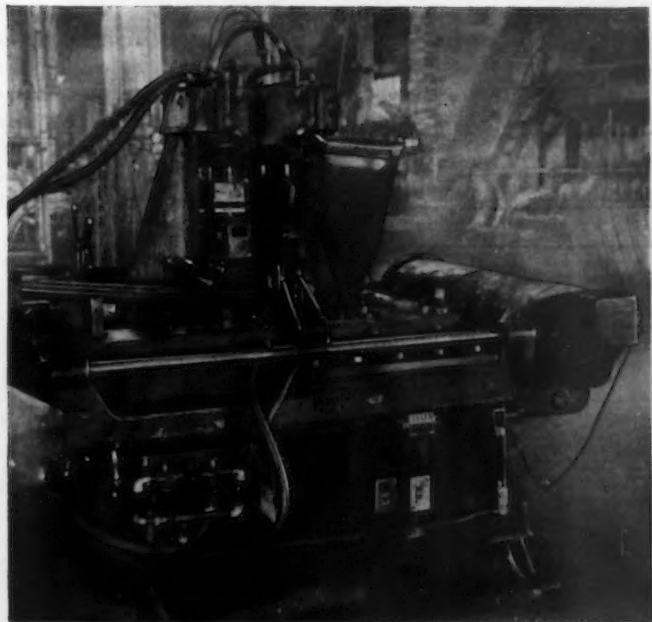
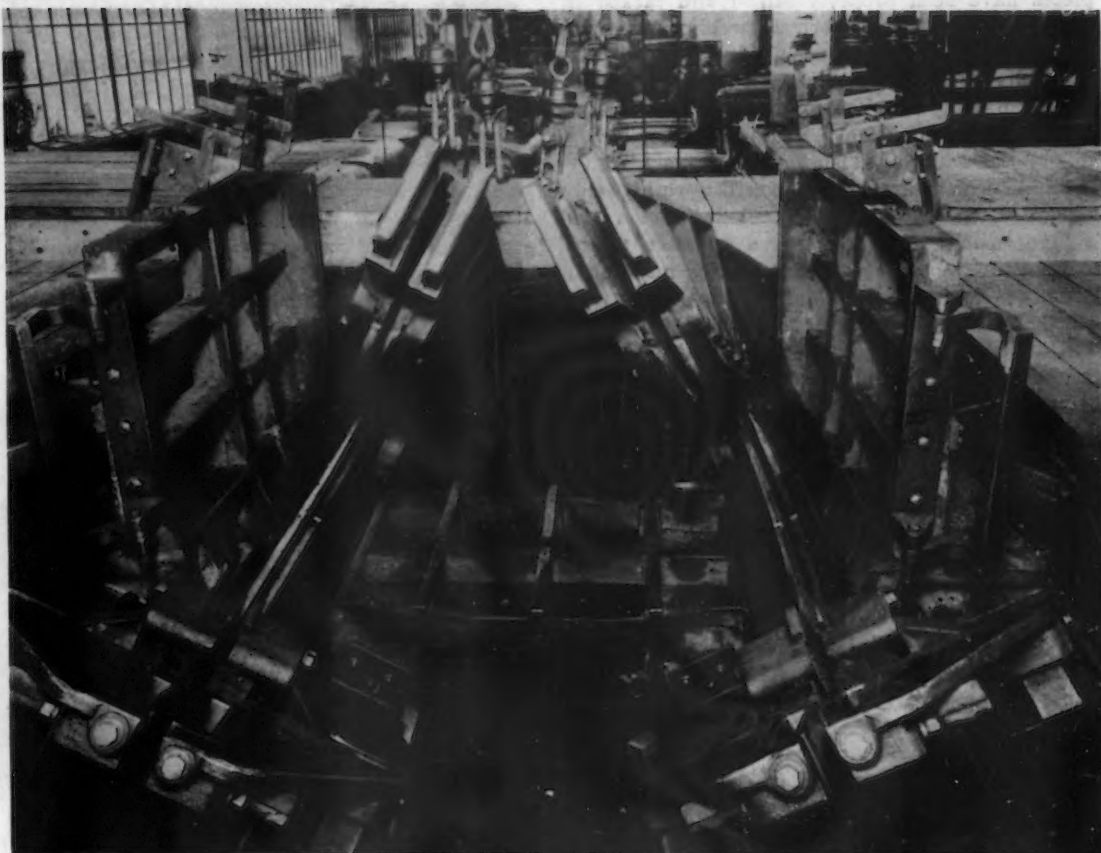
Fig. 2—Unretouched View of Work from Oblique Welder. At left is inner side of seam, showing electrode marks. At right is outer view of door panel, showing not even heat marks at the spot welds



Fig. 3 (Lower Left)—Flash Welder for Roof Panel Joints. If illustration is viewed upside down it will be clearly seen that the work clamped in place is a quarter side panel and roof panel for a coupe

Fig. 4 (at Right)—Looking Down Into the Clamping Fixtures of Flash Welder for Joining Sides to Rear of Steel Auto Body

Fig. 5 (Lower Right)—Toggle Clamps Shown on Floor Are Eliminated by Use of Portable Spot Welders for Assembly Operations



a capacity of 70 in. of 0.043 standard auto body stock and operates by a 2 hp. motor. The weight of the assembled machine is approximately 52,000 lb. The welding dies are of aluminum bronze, to withstand the extreme pressures required to prevent slippage at the weld line. The pressure developed across the face of the dies amounts to approximately 32 tons.

I will give some illustrations of spot welding assembly for front ends. This unit is standard on a line of coupe, sedan, cabriolet and delivery cabs, thus demanding exceptionally high production. Various difficulties have been eliminated by our manually operated "welding conveyor."

The most important operation of the entire assembly is to locate properly the partly assembled outside shell to the interior strengthening or supporting framework. This was

accomplished by jiggging the sub-units in an assembly fixture by means of loose toggle clamps. An improvement in this feature has been the installation of portable spot-welding machines of standard manufacture. Two of these in the hands of operators are shown in Fig. 5; the toggle clamps on the floor are no longer needed. A few spots are placed at fixed points by each operator and the piece is removed. We have found a decided improvement in applying the portable spot welding machine in the line, as it has eliminated a large number of toggle clamps along with the maintenance that they ordinarily require. Another advantage to be found in this assembly method is that once the



pieces have been properly aligned and tacked in place by means of the portable welding machine, no further attention is required, as it will undoubtedly be in perfect alinement when completed.

Fig. 6 shows the unit passing through one of a number of operations on the high production side of the conveyor. The length of track is 296 ft., and accommodates 19 standard upright welding machines. Space is provided between the welding machines, allowing one or more pieces to hang in a neutral position, where any small parts are assembled by jigs to the main unit. The hanger shown is very flexible, allowing the unit to be turned into any required position. This is characteristic of all other operations, as no helpers are required. The trolleys support a sheave wheel or pulley permitting the unit to be placed at such different heights as the various operations may require. The figure also shows that the operator has freedom of both hands. The welding operator along the conveyor is assigned to a certain task and his entire efforts can be localized to this task, in that he is not hampered by a helper moving the piece in a directly opposite position to that desired; neither are his thoughts distracted by the following piece, as ample space is provided between each machine to accommodate at least one piece in a neutral position.

All obstacles encountered in the welding line are overcome in the following manner:

1. Sufficient machines are provided along the conveyor to split up or divide any operation by time study so that the amount of production expected from each operator is equalized.
2. The piece is carried along on hangers that permit any position to be attained. Where a desired position is not possible, the machine is reconstructed.
3. Space is provided, where necessary, between the welding machines where the setter up is located. He applies the jig and piece, and the jig is returned by the operator. Enough jigs are provided.
4. A minimum amount of floor space is required on high productions as no bank of material exists between operations.
5. A minimum amount of handling eliminates damage and dents in the completed unit.
6. A ceiling switch leads to a duplicate line of machines, the one side manned by a skeleton crew. From the latter experienced operators are drawn to keep the main line in full operation (110 units per hour) at all times.

In this explanation of our welding line conveyors I have attempted to illustrate the mass production by welding and

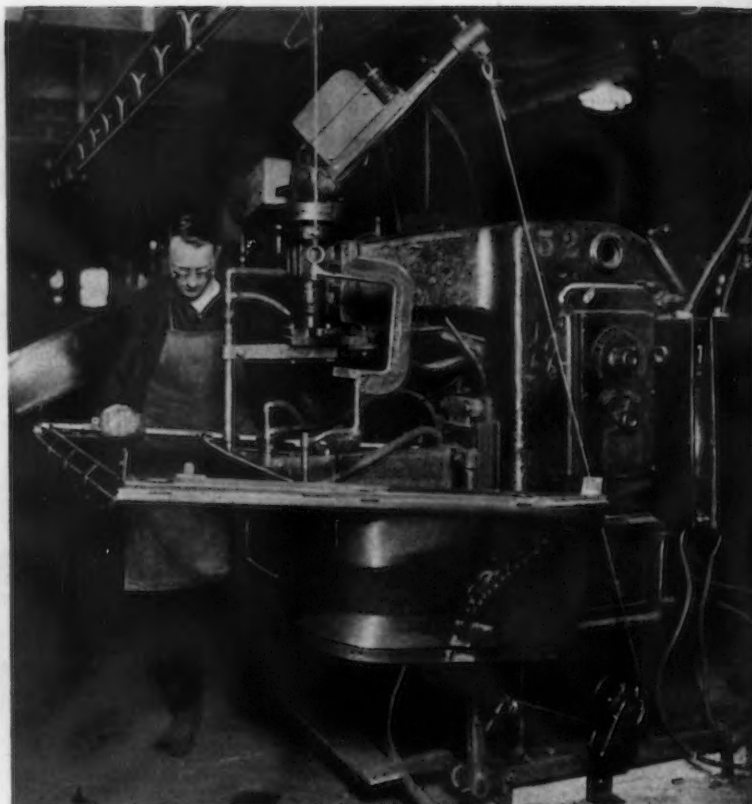


Fig. 6—One of the 19 Machines Required to Assemble Front Ends of Auto Bodies. Slight pressure on foot treadle starts an automatic cycle which completes one spot weld

the difficulties encountered in the handling of a bulky piece. Our method of spot welding is the ordinary one established many years ago, but our application in this respect is entirely new. Large production has been handled by this method for the past two years and it is needless to say that our first thought, in lining up new production, is to establish a welding line conveyor. By means of this production device we have solved the following problems:

1. The sequence of operation.
2. The production per welding machine.
3. The many positions of the piece during welding.
4. The jiggling or locating of small parts to the assembled unit.
5. Minimum floor space.
6. The handling of the unit in a manner that will keep it free from floor marks and other defects.
7. The failure of operators to report each shift.

## Standard Thermometer and Pyrometer Points

SINCE the determination of absolute temperatures according to the thermodynamic scale is accompanied by great experimental difficulties, the United States Bureau of Standards, the (British) National Physical Laboratory and the German Physikalisch-Technische Reichsanstalt have agreed upon certain fixed points and methods of interpolation for reproducing the theoretical scale for practical purposes. Details of the methods of determination and interpolation are given in Research Paper No. 22 of the Bureau of Standards, by George K. Burgess, director. The primary points all at one atmosphere pressure, are as follows:

Boiling point of oxygen	— 182.97 deg. C.
Melting point of ice	0.000
Boiling point of water	100.000
Boiling point of sulphur	444.60
Melting point of silver	960.5
Melting point of gold	1,063

For temperatures below 660 deg. C. the platinum resistance thermometer is to be used for standard; from 660 to 1063, the platinum thermocouple; above 1063, measurements of black body radiation.

Points intermediate to the above are recommended for calibration of secondary thermometers, as follows:

Carbon dioxide sublimates	— 78.5 deg. C.
Mercury freezes	— 38.87
Transformation of sodium sulphate	32.38
Naphthalene condenses	217.96
Tin solidifies	231.85
Benzophenone condenses	305.9
Cadmium solidifies	320.9
Lead solidifies	327.3
Zinc solidifies	419.45
Antimony solidifies	630.5
Copper solidifies	1,083
Palladium solidifies	1,555
Tungsten melts	3,400



# Making of Bolts on a Large Scale

Methods Employed for Mass Production  
at the Lebanon, Pa., Plant of  
Bethlehem Steel Co.

BY GEORGE A. RICHARDSON\*

**A** PREVIOUS article described the initial steps in the manufacture of bolts and nuts at the Lebanon, Pa., plant of the Bethlehem Steel Co. and continued with the processes required in the semi-finishing and finishing departments for the production of the many varieties of nuts. This article traces the steps taken in the finishing of bolts.

The hot bolt department of the Lebanon plant is largely a jobbing one, for in addition to the usual run of bolts varied heading and upsetting operations are carried on. Rivets to special and Government specifications are made here; likewise all special jobs, such as long guy rods which have to be upset on one end.

The nature of the work here is such that automatic machines cannot be used to advantage, and hence the equipment is hand fed and of a comparatively standardized type. Whenever possible, special machinery is used, a recent development being the installation of drop-in die forging machines, on which the gathering can be done in two or three operations on one heat. For instance, in the case of two

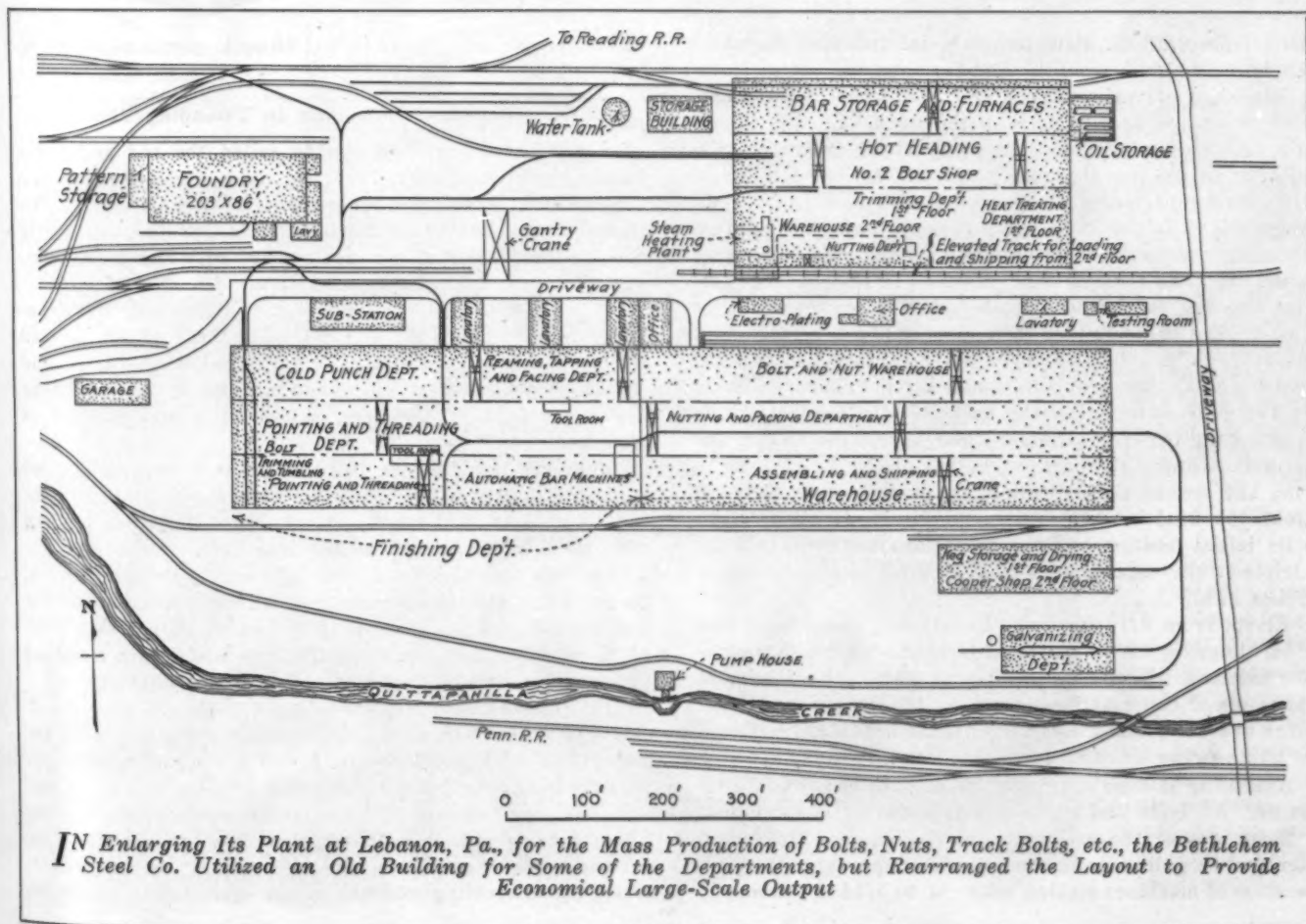
operations, the head will be formed in the first and chamfered in the second. The arrangement of a machine of this type is such that three dies can be mounted on the header, one above the other. Grooves or slots in the side of the frame in front of the header are so located that they are opposite to the dies. The operator takes the heated bar, and, as he pushes it forward against the header, uses one of the slots or grooves as a guide. As the header goes back for the second stroke he drops his rod in the second position and thence to the third position. This speeds up production considerably.

Bolts from 3/16 in. diameter to 2 in. diameter are made in this shop, square and hexagon heads predominating. The bar stock is sheared to the required length on its arrival, heated and upset.

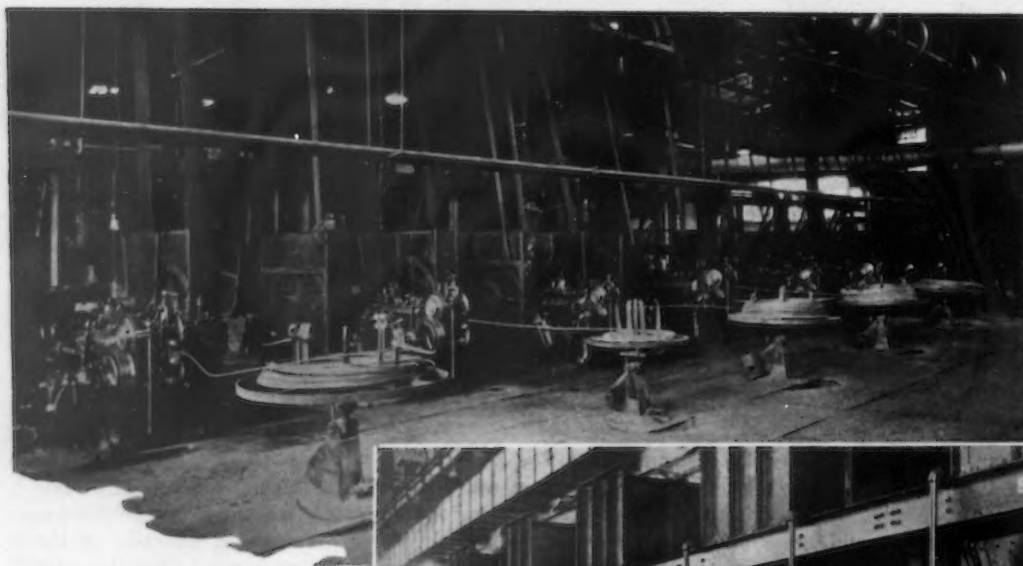
## Automatic Machines for Cold Bolts

In direct contrast to that of the hot bolt department, the work in the cold bolt department is carried on entirely with automatic machines. The nature and volume of the work readily lend themselves to this type of production.

\*Bethlehem Steel Co., Bethlehem, Pa.



**I**N Enlarging Its Plant at Lebanon, Pa., for the Mass Production of Bolts, Nuts, Track Bolts, etc., the Bethlehem Steel Co. Utilized an Old Building for Some of the Departments, but Rearranged the Layout to Provide Economical Large-Scale Output



**V**ARIOUS Types of Machines Are Used for Pointing Bolts, Depending Partly on the Size of the Bolts. The semi-automatic pointing machines (below) take care of short bolts up to 3 in. diameter

**T**HE Work in the Cold Bolt Department (Above) Is Done Entirely With Automatic Machines, Which Turn Out from 70 to 125 Bolts per Min., According to Size



Bolts from 3/16 in. diameter to 1/2 in. diameter, inclusive, can be made from stock in cold-drawn coils.

Machines of various types are used, some of the variations depending upon the size of the stock. Equally important are the kind and amount of upsetting required. For instance, in one row there are single-stroke, two-stroke and triple-stroke machines. In a single-stroke machine the operations are as follows: Gripping dies open and as the stock advances, close again tightly, while the material is sheared to length. The sheared piece of stock is then moved side-wise opposite the header, which comes forward and forms a head. The gripping dies then open, the bolt is pushed out and drops on to a belt conveyor which carries it to the container. In the case of the double-stroke machines there are two dies mounted on the header. On the first stroke an upsetting die comes forward and upsets the end of the material. During the back stroke the header rises so as to bring the second die in position, and on the next forward stroke the final heading is done. The header then drops to its initial position and the operations are repeated. In a triple-stroke machine there are three dies and three strokes in all.

Rivets from 3/16 in. to 1/2 in. are regularly made and 3/8 in. diameter rivets are occasionally made on a single-blow machine. Rivets are always annealed. For the general range of bolt-making operations, the double-stroke machines are used, but where large, thick heads are required the triple-stroke machine gives the best results.

Annealing is done after cold heading to remove forging strains. All bolts and rivets are annealed or heat-treated.

Some idea of the production of machines of this character can be gained from the following figures: Speed of operation of machines making bolts: 1/4 to 5/16 in. diameter,

125 bolts per min.; 3/8 to 1/2 in., 86 bolts per min.; 1/2 to 3/4 in., 70 bolts per min.

#### Miscellaneous Work Done in Threading Shop

No. 3 threading shop can be called the rod and turnbuckle department, for here are made rods, turnbuckles, clevises, etc., mostly for bridge, dock and wharf work. The miscellaneous nature of the operations involved intimately ties up the routine of this department with that of a number of others. A few examples give an idea of this:

Billets for turnbuckles are sheared at the mill and drop-forged in the forge department. The flash or fin formed during the forging operation is trimmed, both inside and out on a cold press or cold punch machine in the threading department, where the necessary drilling and tapping is also done.

Rods are rolled at the 10 in. or other mills and sheared to desired length in the threading department. All remaining operations such as upsetting, threading and placing nuts, turnbuckles or clevises are done here.

Clevises are made on a large hammer in the smith shop, trimmed hot and then sent to the threading department for drilling. They then go back to the smith shop to be "set" or "formed" to customers' requirements and return a second time to the threading department for final finishing.

The equipment of the threading department consists of standard types of forging and threading machines. The nature of the work precludes the use of automatic machinery. Facilities are provided for threading jobs up to 4 in. diameter. In addition to the specialties already mentioned, sleeve nuts, street railway tie rods, both round and flat, various types of guy rods, straps, eye-nuts, etc., are made here. An interesting example of the special jobs which go



through here is a four-part tie rod for dock use, having a clevis on each end and two turnbuckles between.

Material that is to be finished in the finishing department is transferred by rail. All materials are assembled in individual containers in a room set apart for this purpose and loaded on buggies hauled by an electric locomotive on a narrow-gage track.

The remainder of the work of the finishing department has to do with finishing bolts. Although this work is divided, large bolts being handled in the middle bay and smaller bolts in the south bay, the general nature of the operations is the same, and one description will suffice for two separate and distinct units. As mentioned, large bolts are those  $\frac{5}{8}$  in. in diameter and upward. All material comes in at the upper or west end of the bays, where it is unloaded and despatched by crane to machines for the first of the operations which are described in their relative order, as follows:

**Trimming.**—The nature of the trimming operation depends on whether the bolts have been made cold or hot. Bolts up to  $\frac{5}{8}$  in. diameter are made cold and have a round flat upset for a head. This is trimmed to a hexagon or square, as desired. In the case of bolts made hot, the flash or fin formed in the forging operation has to be removed. In the middle bay most of the bolts, by reason of size, have been made hot.

Two types of trimming machines are in use. Standard bolts are trimmed on automatic machines; special bolts on hand fed machines of simpler design. The hand fed machines are semi-automatic in their action, and are made in

several sizes. A revolving drum is provided. Near each end and properly spaced around the circumference are holes which serve as position locks. Trimming dies are mounted around the circumference of the middle of the drum, and in the course of rotation the bolts are set shank downward in the dies by hand. At the top point of travel spindles come down into the locking holes and hold the drum in position. At the same time a punch comes down and pushes the bolt through the die. The bolt in turn drops out on a scrap separator where the scrap is removed. On the smaller machines of this character handling bolts up to  $\frac{1}{2}$  in. diameter by 6 in. long, as a maximum. One man can trim 35,000 bolts per day.

#### Bolts Trimmed by Automatic Machines

Bolts to be trimmed are brought to each automatic machine by crane in containers and dumped into the large storage bin located directly above the operating mechanism. They feed down into an open hopper in the middle of which a knife-like device moves up and down. This blade is known as the center board, and is made up of two plates kept apart by separators so that there is a slot in the top edge. The width of this slot depends upon the size of the bolts that are to be handled, and different center boards are provided for each size. As the center board moves up through the hopper, some of the bolts fall into the slot and hang on the edges by the head. A continuation of the upper travel makes the slope of this slot great enough so that the bolts slide down to the lower end by their own weight, and enter a small chute or track which serves as a

**AUTOMATIC**  
Heading Machines (Right) Facilitate Rapid Production. On some machines of this type the head will be formed in the first and chamfered in the second



**AUTOMATIC**  
Vertical Pointing Machines, Equipped With Two Rotating Spindles, Point a Maximum of 80 Bolts per Min. for Each Spindle (Left). Nine of these machines, operated by two men, point about 300,000 bolts per day.

continuation of the slot. At the junction of the slot with this track a mechanical monitor stops the progress of all bolts not properly delivered and returns them to the hopper. From the lower end of the track, the bolts are transferred one at a time to the header by a series of mechanical motions that appear almost human. A cut-off clevis holds back the descending blanks and at the proper instant by a rocking motion separates and releases the lowermost bolt, allowing it to fall into the spring jaws of a carrier or transferring finger device. This finger picks up the bolt which is hanging downward with the head up, turns it through an angle of 90 deg. during the transfer period and places it in a header in a horizontal position with the head out. The header then comes forward and pushing the bolt



**TWO** Types of Trimming Machines Are Used, the Automatic, Shown in the Illustration, and Hand Fed Machines of Simpler Design for Special Bolts. About 18,000 bolts per day can be trimmed on these machines, two of which are operated by one man

through the trimming die causes the head to be trimmed and the bolt ejected at the front of the machine. Scrap drops underneath.

About 18,000 bolts per day can be trimmed on these machines, two of which are run by one man. The slowness in operating speed is offset by the improved quality of the work, resulting from the fact that the punch does not run into the die.

Work of a miscellaneous character is also handled in the trimming department. Normally, boat and dock spikes, etc., are pointed hot while making. Occasionally, however, pointing cold is called for and in this case the work is done here with a punch type press provided with a taper die. Machines adapted to this use are also used for bending U-bolts.

**Tumbling.**—All bolts are tumbled after trimming for cleaning and to get rid of burrs and sharp edges. Sawdust is used for cleaning, and a riddle at the discharge end of the tumbler separates all scrap from dirt. The bolts themselves drop on an inspection belt.

**Pointing and Threading.**—These, of course, are important operations. The types of machines are numerous. Their use depends partly on the size of the bolts and partly on other conditions. Some are automatic, some semi-automatic and a few are hand-operated. For simplification these descriptions will be grouped on the basis of type as follows:

(a) **Automatic Vertical Pointer.** These machines are provided with two rotating spindles moved alternately up and down by a rotating cam. On the ends of the spindles are heads containing the pointing dies. Bolts feed automatically and as the spindle comes down the pointing is done. On the up stroke a slide comes down and pushes the bolt out of the machine. A maximum of 80 bolts per min. can be pointed by each spindle. There are nine of these machines in all, operated by two men. The average production is in the neighborhood of 300,000 bolts per day within size limits  $\frac{1}{4}$  to  $\frac{5}{8}$  in. diameter x  $\frac{3}{4}$  in. to 4 in. long.

(b) **Automatic Vertical Threader.** The only point of difference from the above machine lies in the dies. Spindles rotate at a speed of 450 r.p.m.; oil pressure 60 lb. Two men and eleven machines average 110,000 bolts per day. Size limits  $\frac{1}{4}$  to  $\frac{5}{8}$  in. diameter x  $1\frac{1}{2}$  to 4 in. long.

(c) **Automatic Pointing and Threading Machine.** Both operations are performed on the same machine. Bolts feed down a runway and are carried over to the die head by a conveyor. At this point, a jaw-grip holds the bolt steady while it is raised in a horizontal position. The pointing tool comes up against it first and is followed by the threading head. Sixteen of these machines average 70,000 bolts a day. Only  $\frac{1}{2}$ -in. bolts are handled in lengths ranging from  $2\frac{1}{4}$  to 6 in.

#### Semi-Automatic and Special Machines

(a) **Pointing Machines.** Special job lots are pointed on hand-operated machines, which have a capacity of about 20,000 bolts a day. Short bolts up to 3 in. in diameter are taken care of on semi-automatic machines which handle about 30,000 a day. Large work is pointed on a rotating turret, 18,000 a day being an average output.

(b) **Pointing and Threading.** Among the special machines are some designed for handling long bolts. The pointing is done first, followed by the threading; 9000 bolts a day can be machined, lengths ranging from 6 to 36 in.

(c) **Thread Rollers.** In addition to the cutting method of threading, many bolts are threaded on thread rolling dies. Standard cold-made bolts  $\frac{3}{8}$  in. diameter and smaller are threaded on hand fed roll threaders. Thirteen machines, each with a capacity of about 30,000 bolts per day, can handle almost any length in diameters ranging from  $\frac{3}{16}$  in. to  $\frac{1}{2}$  in. All of the threading is done cold. Thread rollers of greater capacity will thread cold bolts from  $\frac{1}{2}$  to  $2\frac{1}{4}$  in. in diameter.

(d) **Gimlet Pointing.** Some orders call for gimlet points. The machines used for this purpose have a stationary die which is moved forward by hand at an angle against the revolving bolt. About 12,000 a day can be pointed, diameter range  $\frac{1}{4}$  in. to 1 in.; maximum length, 46 in.

(e) **Miscellaneous.** Miscellaneous jobs are threaded on hand fed threaders. Quite a few varieties of miscellaneous work are done in this same department. For instance, any drilling required for cotter pins can be done economically on a production basis. Turned and finished bolts and bolts made of special steel are worked up and threaded on stud machines and turret lathes. Stud bolts can be threaded all over; accuracy of threading is obtained by use of a lead screw. Head shaving machines are provided to meet the needs of work of that character.

All cold bolts are treated and blued, the process used cleaning the surface, increasing the strength, relieving strains set up in heading and giving a black finish that prevents rust. One of the advantages of this process is that a clean bolt is obtained for packing.



# Special Steels for Special Purposes

## Requirements of the Aircraft Industry Are Broad and Exacting—Alloy Steels for Rust and Heat-Resisting Purposes

THERE were two papers presented at the thirty-fourth general meeting of the American Iron and Steel Institute in New York on Oct. 26 on special steels for special purposes. One was a paper by Dr. W. H. Hatfield as noted below. It was read by title only because

it was not possible for the author to be present. Doctor Hatfield delivered the Campbell memorial lecture before the American Society for Steel Treating at Philadelphia on Oct. 10 and in THE IRON AGE of Oct. 18 a brief biographical sketch of him was published.

### Steel Requirements of the Aircraft Industry

BY H. J. FRENCH

WHILE the tonnage requirements for steels used in the construction of actual flying equipment will probably remain small, quality steels are used, whose value per unit of weight is relatively high. The business secured during the first seven months of 1928 from the aircraft industry has led one steel manufacturer to conclude that the demand during 1929 will be not less than 1500 tons of alloy steels for engine parts, 3000 tons of alloy steel for tubing, 100 tons of alloy steel for bearings and 50 tons of alloy steel sheet and strip. The total has a market value of about one million dollars.

Stated in terms of airplanes the recorded and estimated production is as follows:

Year	Number of Planes	Value
1926.....	1,200	\$8,900,000
1927.....	1,828	14,130,000
1928.....	7,000	.....

Over 10,000 engines will be built in 1928, one manufacturer producing 160 per month.

Disregarding the steel demanded for manufacturing plants, tools and equipment, and for hangars, flying field and service stations, the technical requirements fall into two natural groups: (a) for engines and (b) for aircraft structure.

There are three general requirements for steels used in the construction of actual flying equipment. They should have (1) high strength per unit of weight to permit lightness in the craft; (2) high quality to insure reliability and satisfactory performance; (3) ease of fabrication; and sometimes (4) the ability to meet special performance or maintenance requirements.

As shown in the table, hard drawn wire has the highest strength per unit of weight of any of the commonly used materials of construction. The strength-weight factors of heat-treated alloy steels are about the same as some of the light alloys. However, the latter have a higher bulk modulus; for equal weight and strength the aluminum alloy parts will have a greater thickness and therefore have greater rigidity (stiffness) than the corresponding steel parts.

Aircraft steels must have a high order of purity, cleanliness and uniformity. Inspection can make or mar the reputation of the products. In individual cases each bar of steel, for such parts as piston pins, may be analyzed chemically and the treated parts each examined for flaws and hardness. Crankshafts and connecting rods are generally etched at some stage of manufacture to assist in the detec-

tion of minute imperfections, and finally ground or polished all over. For some time, one steel manufacturer has examined microscopically for inclusions all alloy steel billets intended for high-strength aircraft engine parts such as crankshafts. The commercial production of such super-clean steels requires modifications in mill practice and the trend has been toward the electric furnace product, since it is difficult to meet these requirements regularly with open-hearth steels. In some cases cleanliness has been obtained at the expense of other desirable properties. The super-clean steels are generally coarse grained and are difficult to heat treat without cracking. Impact values of the quenched and tempered steels also may be low and the forging ranges are narrow.

Strength-Weight Factors and Elastic Moduli of Wrought Metals Used for Aircraft

(Approximate Values in Tension)

Materials	Elastic Moduli, Million Lb. per Sq. In.	Strength, Lb. per Sq. In.	Specific Gravity	Strength, Lb. per Cu. In. Divided by 1000
Music wire, 1/16-in. diameter .....	27 to 30	325,000	7.85	42
Structural alloy steel, heat treated.....	27 to 30	100,000 to 200,000	7.85	13 to 25
High nickel-chromium corrosion - resistant steels .....	27 to 30	100,000 to 150,000	7.85	13 to 19
Duralumin (4 Cu, 0.5 Mg, 0.5 Mn, 0.25 Si, balance Al) .....	10	55,000	2.85	19
Magnesium alloy (4 Al, 0.4 Mn, balance Mg) ..	5 to 6	35,000 to 45,000	1.77	23
Mild steel, normalized. .	27 to 30	55,000	7.85	7
Aluminum, annealed....	10	12	2.7	4.4

At present there are two schools of thought, one holding that present good commercial qualities should be utilized; the other contends that the best is none too good for this stage in aircraft development, when standards of performance and reliability are being developed. The latter school seems to be in the majority, and if the steel manufacturer will look upon the aircraft industry as a testing laboratory and utilize the lessons it will teach in obtaining cleanliness, uniformity and special properties, at least a part of the older industry will learn much about steel making and about the application to quantity production of some of the information now available but not applied.

Corrosion is one of the most important problems to be defeated, especially in equipment operating over or near salt water. The use of protective coatings may enable the designer to use methods and products which would otherwise

not serve satisfactorily. Corrosion of duralumin gives concern at times, especially near the lower wing hinges on sea-planes. The structure here is somewhat open and may be splashed or covered with salt spray when floating. Corrosion by inter-crystalline attack causes the metal to become quite brittle; frequently this is concentrated near the rivets.

Corrosion in parts working under rapid reversal of stress is especially damaging. Heat-treated nickel-silicon steel, when properly protected, has an endurance limit of 108,000 lb. per sq. in., but when wet with mildly corrosive liquids the piece will endure alternations of stress no higher than 12,000 lb. per sq. in. When corrosion and repeated stress both come into play, only the high-chromium steels can be considered to be in competition with duralumin (with its corrosion-fatigue limit at about 8000 lb. per sq. in.) on a strength-weight fatigue basis. This illustrates why duralumin and stainless steels (not carbon steels) are the competing materials in the airships which the British are reported to be building in parallel. Performance records for these two ships should throw much light on the relative efficiency of duralumin and stainless steel construction.

Slightly over 50 per cent of the weight of an air-cooled motor is steel. Nearly all of it is alloy steel, except the cylinders. Those of the Gnome engines, manufactured in the United States about 1916, were made of about 0.5 per cent carbon steel forgings normalized after forging. Liberty engine cylinders, produced during the early part of the World War, were formed hot from seamless steel tubing or pierced and drawn from forged blanks of steel containing about 0.4 per cent carbon and then heat treated. Steels containing about 0.45 per cent carbon are used in the cylinder barrels of modern air-cooled engines, such as the Whirlwind, Wasp and Hornet. One manufacturer is using nickel steel castings, another is using welded chromium-molybdenum steel, and there is a possibility that the nitrided special steels will find application in cylinder construction. Recent experiments in France showed that the latter work in contact with ordinary carbon steels and aluminum alloys without excessive heating. The wear of pistons and rings was reduced, and oil consumption did not increase as rapidly with continued operation as with ordinary carbon steel cylinders.

Steels used for engine forgings are shown in the table—medium-carbon, nickel-chromium analyses are favored. However, there is no standardization. So long as the required mechanical properties can be secured by simple heat treatment, the chemical composition is of much less importance

than the quality of the steel and the ease of forging and machining. Flaky fractures, hair line seams or cracks, inclusions and lack of uniformity are viewed with suspicion and have probably caused more rejections than chemical requirements.

Exhaust valves are an example of severe performance requirements. Operating conditions vary with the engine but temperatures up to 1600 deg. Fahr. are encountered. Hollow stems filled with oil, mercury or salt have been used to reduce the operating temperatures, and this device, as well as other features of design, has been helpful in prolonging the life of valves. However, there is still need for improved valve steels that will better resist erosion from the hot exhaust gases, have a low rate of oxidation, maintain their hardness at exceedingly high temperatures and permit easy fabrication and the production of hard strong stems.

Valves frequently fail by a portion of the head burning away, by mushroomed stems, by excessive scaling and by cracked heads. Of the many steels used, those shown in the table seem now to have the preference.

The wooden propeller has now been replaced quite largely by the metal, which does not chip and split when operating in snow and sleet. However, metal propellers are subject to fatigue and special attention must be given to the surface finish. Most are made of a forged aluminum alloy containing about 4.5 per cent copper, 0.75 per cent manganese, 0.75 per cent silicon, and the remainder aluminum. Steel propellers have been produced and, according to some writers, are entirely satisfactory for fast planes. However, they have not yet been used to any great extent in America.

There is still a wide difference in materials and methods for fuselage and wing construction, not only due to the different requirements of a small messenger plane and a huge bombing sea-plane, but also due to the practices of the different countries.

In England there has been a tendency to retain wood construction and, where metals are employed, to use steels where possible. Aluminum alloys have gained considerable favor in Germany and France, while in the United States steel and duralumin construction are both widely used.

Even in cases where the required stiffness can be obtained, steels have apparently less chance of successful application in small equipment than in large, since for equal strength and weight the steel parts are so thin that manufacturing difficulties are encountered and corrosion in any degree becomes dangerous. In this country practice varies

Typical Steels Used in Aircraft Engines

Chemical Composition—Per Cent

Steel	C	Mn	Si	Ni	Cr	V	Mo	W	Co	Remarks
Structural Alloy Steels for Crankshafts, Connecting Rods and Other High Stress Engine Parts										
3½ per cent nickel*	0.40	0.65	...	3.5	...	...	...	...	...	Connecting rods and bolts
Nickel-chromium	0.40	0.65	...	1.25	0.6	...	...	...	...	Crankshafts
Nickel-chromium†	0.40	0.65	...	1.75	1.0	...	...	...	...	Most popular composition for crankshafts
Nickel-chromium	0.40	0.65	...	1.0	1.0	...	...	...	...	
Nickel-chromium	0.35	0.65	...	3.0	0.75	...	...	...	...	
Chromium-vanadium	0.35	0.80	...	...	0.9	0.18	...	...	...	
Nickel-chromium	0.15	0.65	...	1.25	0.6	...	...	...	...	Carburized—for valve tappets
Gears and Pins										
Chromium-vanadium	0.50	0.70	...	...	0.9	0.18	...	...	...	Carburized } Drive and reduction gears Gears and case hardened pins Oil hardened gears
5 per cent nickel	<0.17	0.35	...	5.0	...	...	...	...	...	
Nickel-chromium	<0.12	0.45	...	3.5	1.5	...	...	...	...	
Nickel-chromium	0.35	0.45	...	3.5	1.5	...	...	...	...	
Valves										
Chromium-silicon	0.45	...	2.5	...	8.0	...	...	...	...	Inlet and exhaust valves
Chromium-tungsten	0.60	...	...	...	0.75	...	...	1.75	...	Inlet valves
Chromium-tungsten	0.60	...	...	...	3.5	...	...	13.5	...	Inlet and exhaust valves
Chromium-tungsten	0.60	...	...	...	3.5	...	...	16.5	...	Inlet and exhaust valves
Cobalt-chromium	1.3	...	...	...	13.0	...	0.75	...	3.0	Inlet and exhaust valves
Miscellaneous Parts										
High-chromium	<0.30	...	...	13.0	...	...	...	...	...	Pump shafts, experimental
High-chromium	<0.12	...	...	13.0	...	...	...	...	...	} Largely experimental where corrosion resistance is desired
High-nickel-chromium	<0.12	...	8.0	20.0	...	...	...	...	...	
14 per cent manganese	2.0	14.0	...	...	...	...	...	...	...	Tail skid shoe
High-nickel-chromium	0.35	...	2.5	25.0	17.0	...	...	...	...	For non-magnetic properties

\*Same steel with 0.30 per cent C used in bolts on plane construction.

†Some makers use 0.60 per cent Cr instead of about 1 per cent.



**B**ORN in New York, H. J. French was graduated in 1915 from the School of Mines of Columbia University. From 1915 to 1918 he was successively a chemist in the Murray, Utah, plant of the American Smelting & Refining Co. and metallurgical engineer for the General Vehicle Co., Long Island City, N. Y. From 1918 to 1919 he was chief metallurgical inspector in the Philadelphia territory for the bureau of aircraft production, United States Army, and subsequently was transferred to supervise tubing work in the Pittsburgh district. He joined the metallurgical staff of the United States Bureau of Standards about 1920, and since that time has been engaged largely in metallurgical investigations relating to both the ferrous and non-ferrous metals industries.



widely, but fuselage and control surface construction is generally either of steel or duralumin, while the wing structure is most often made of wood or duralumin with steel fittings and wires. Steel is used for spars, especially in large units, but the wing ribs are usually of duralumin or wood. The landing gear and engine mounts are generally made of steel but aluminum alloy construction is also found.

Steel construction is generally based on seamless steel tubing with welded joints. Duralumin construction requires riveted joints in formed sheets or tubes, as it is impracticable to secure satisfactory welded joints, and hence requires much handwork. Composite construction ordinarily requires from 25 to 33 per cent of its weight of steel for fittings and wire.

Only a few steels have been generally adopted for stressed members of aircraft. These comprise mild carbon steels in the form of sheets, bars and tubing, medium-carbon steel for forgings and tubing, high-carbon steels for springs and tension wires, chromium-molybdenum steel sheets, bars and tubing. Typical compositions are shown in the table.

The popularity of chromium-molybdenum steel for welded structures is due to a combination of desirable properties. The steel may be readily cold drawn to small-size seamless tubes. Sound welds can readily be produced and, due to the air hardening properties of the steel, the strength of the welds without any subsequent heat treatment is nearly on a par with that of wrought steel. It decarburizes very rapidly and it is the practice to make the steel with somewhat higher carbon than that desired in the finished parts. For this reason difficulties have been encountered in securing the desired mechanical properties on heat treatment, due to excessive surface decarburization which lowers the average carbon content of the relatively thin sections. In light-gage sheets and tubes, as in many engine parts, a high degree of uniformity is necessary, if cracking is to be

avoided in built-up fittings which are now so widely used. Uniform mechanical properties parallel and, at right angles to the direction of rolling, are greatly desired.

Stainless steels have not yet been used extensively for aircraft construction but offer promising possibilities. For example, water-tight pontoon construction is difficult to obtain with duralumin, which tends to corrode at welded joints unless heat treated after fabrication. As heat treatment is generally impracticable, riveted and caulked joints are now used. Satisfactory joints have been obtained in experiments with soldered stainless steels, and this practice is simpler and cheaper than that required with the present aluminum alloys. A limited application of stainless steels is found in engine exhaust pipes and exhaust line valves.

#### Views of Different Commentators

**R**APID expansion in demand for aircraft and the large number of small manufacturers now engaged in building them have been responsible for the diversity of metals and alloys demanded, in the opinion of John F. Hardecker, chief draftsman United States Naval Aircraft Factory, Philadelphia. He decried much of this, pointing out that it involved difficulties and extra expense in purchasing, stocking, and production. If each steel is carried in the range of sizes, shapes, and finishes used by several well-known models, the multiplicity approaches the impossible. Both the Army and Navy realized this situation some time ago and have led the way in reducing the number of different alloys used, without attempting to get ideal steel for every part. Cooperation of commercial builders is now necessary, even if only to standardize the methods of inspection and test to insure an "aircraft" grade of quality which will be suitable for the various uses.

E. C. Smith, assistant general superintendent, Central Alloy Steel Corporation, Canton, Ohio, emphasized that por-

Typical Steels Used for Fuselage Construction

Steel	Chemical Composition—Per Cent					Remarks
	C	Mn	Cr	V	Mo	
<b>Sheets</b>						
Chromium-vanadium .....	0.22	0.80	0.9	0.18	...	Being replaced by Cr-Mo Body steels—riveted and welded construction
Chromium-molybdenum .....	0.30	0.50	0.9	...	0.20	
Mild carbon .....	0.25	0.65	...	...	...	
Very low carbon .....	0.10	0.65	...	...	...	
<b>Tubes</b>						
Mild carbon .....	0.15	0.65	...	...	...	Body steels—riveted and welded construction Large amount supplied for body work
Mild carbon .....	0.25	0.65	...	...	...	
Chromium-molybdenum .....	0.30	0.50	0.9	...	0.20	
<b>Wire</b>						
Medium-carbon .....	0.45	0.65	...	...	...	Streamline wire
Carbon-manganese .....	0.45	1.0	...	...	...	Beading and general utility
High-carbon .....	0.95	0.30	...	...	...	Music wire for springs
Chromium-vanadium .....	0.50	0.70	0.9	0.18	...	Valve springs

tion of Mr. French's paper which showed that little more than half the metal in an airplane engine is steel. Whether this percentage is to grow or to diminish was, in his opinion, a matter of the relative ability of the steel and the non-ferrous industry to develop the required alloys for such specialized purposes. Consequently it is of the utmost importance that the steel supplied now be nothing but the very best, and capable of passing the rigid military requirements by a comfortable margin. The present steels used are little different from the grades supplied to automobile manufacturers; aircraft required more metal on the order of 200,000 lb. per sq. in. tensile strength. The new carbide tools would probably aid in solving the troublesome machine work on such hard, strong steels. He also felt that the austenitic stainless steel (described by Doctor Hatfield in the same meeting) would be very useful, because of its weldability.

Mr. Smith also gave a detailed discussion of the steel requirements for crankshafts of the multiple-throw and single-throw engines now being constructed. The former requires a longer and bigger forging, therefore a bigger billet and a higher starting temperature. The super-clean steels described by Mr. French, when used for such forg-

ings, must be heated under pyrometric control; otherwise the roller or hammer man would probably overheat them, especially should he rely upon the usual criterion: viz., ease with which the steel fills the roll pass or die.

Drawing a parallel with the electrical industry, Dr. Zay Jeffries, consulting engineer Aluminum Co. of America, said that undoubtedly aircraft will become one of the major influences on the steel industry. Fifty years ago, a prophet would have said that the steels consumed in electrical and magnetic equipment would not likely amount to a large percentage of the total; yet the iron consumed in manufacturing plants and equipment, in generating stations, substations, and transmission towers is a very respectable tonnage. Likewise Doctor Jeffries feels that the chief outlet for steel will be not so much in the aircraft and engines, which will probably favor light alloys, as in manufacturing plants, service stations, airways and landing fields.

He also pointed out that since it is worth about \$40 to save a pound in weight in a plane, the cost of the best steel is justified. Furthermore, since service failures are so liable to cause loss of life, the trend will be to design aircraft for a certain number of safe hours service, and junk them completely at the end of that period.

## Rust, Acid and Heat-Resisting Steels

BY DR. W. H. HATFIELD

IN Britain and in Germany substantial progress has been made since the discovery of stainless steel for cutlery, 13 years ago by Brearley, and there are now available chromium and chromium-nickel steels of such mechanical and corrosion-resisting properties that a very wide range of requirements can be fulfilled. Six classes of steels as shown in the accompanying table are the ones now most widely used.

Chromium steels 1, 2 and 3 are of the same class, and if heated to a temperature of 1740 to 1830 deg. Fahr., they harden in proportion to the carbon content. In practice, they are hardened, and then can be subsequently softened by tempering to the requisite condition of mechanical strength desired. These are martensitic steels.

Chromium-nickel steels 4, 5 and 6 are in a separate class. If they are heated to a high temperature and quenched they do not thereby become hardened, but instead are put into a very ductile condition, i.e., they are austenitic steels.

The chromium-steel 2, which is used for general high tensile engineering purposes, is put into the mechanical condition indicated in the table by hardening followed by suitable tempering, in which form it is supplied. In the condition given, it may be machined with reasonable ease and is widely used with success for parts required to resist atmospheric corrosion, superheated steam and many other conditions. It is clear that the next mechanical condition of rustless steel required by the engineering and the industrial world was that in which it could easily be deformed

Physical Properties of Common European Steels

	Steel	Analysis						Tensile Properties							Physical Properties						
		C	Mn	Si	S	P	Cr	Ni	Limit of Proportionality, lb. per sq. in.	Yield Point, lb. per sq. in.	Maximum Stress, lb. per sq. in.	Elongation, per cent	Reduction of Area, per cent	Izod Impact Test, foot-pounds	Erichsen Deep Cupping Test, mm. (18-gage sheet)	Specific Gravity	Coefficient of Expansion, be- tween 20 and 200 deg. C., per deg. C.	Specific Heat, 0 to 100 deg. C., gm. calories per gm.	Thermal Conductivity, 20 to 100 deg. C., calories per sq. cm., deg. C. per cm.	Electrical Resistivity, microhms per cm. cube	Maximum Magnetic Permeability
1	Stainless for cutlery Hardened 1760 deg. Fahr. Tempered 356 deg. Fahr.	0.30	0.30	0.20	0.015	0.015	13.0	0.30	.....	.....	237,400	...	...	...	...	7.76	0.0000097	0.115	0.043	65	75
2	Stainless for engineer- ing purposes Hardened 1760 deg. Fahr. Tempered 1382 deg. Fahr. Annealed 1562 deg. Fahr.	0.30	0.30	0.40	0.015	0.015	14.5	0.30	60,500	72,300	108,400	27.6	63.6	52	...	7.77	0.0000109	0.117	0.050	54	650
3	Stainless iron Hardened 1700 deg. Fahr. Tempered 1292 deg. Fahr.	...	...	...	...	...	...	...	29,100	35,600	67,400	40	75	96	9.7	7.73	0.0000110	0.115	0.046	56	500
4	Austenitic (a) fully softened	0.09	0.18	0.14	0.015	0.015	13.4	0.28	53,800	72,300	92,500	26.5	65.7	100	...	7.73	0.0000110	0.115	0.044	56	400
5	Austenitic (b) fully softened	0.15	0.28	0.29	0.016	0.017	14.8	10.9	24,600	29,500	83,500	66.5	68.0	110	15.5	7.99	0.0000180	0.117	0.032	74	1.01
6	Austenitic (c) fully softened	0.14	0.30	0.30	0.015	0.016	18.1	7.9	27,300	34,700	100,800	71.0	62.0	110	16.0	7.92	0.0000177	0.117	0.033	69	1.01
		0.28	0.30	0.16	0.02	0.02	21.0	5.8	33,600	47,000	116,500	55.0	58.0	84	13.0	7.87	0.000017	0.118	0.035	67	1.01



cold to shape, and the steel given as 3 indicates the degree of success attainable by lowering the carbon content.

However, it was found that the chromium-nickel austenitic steels 4, 5 and 6, fulfilled more completely this particular demand of the industrial world. The heatings sometimes necessary in manipulation do not lead to air-hardening difficulties.

From the mechanical testing point of view, the distinctive feature, apart from their high ductility, is their high impact value, which is generally in excess of 100 foot-pounds (Izod test, British standard conditions).

Particularly noticeable is also the increased coefficient of expansion, and the thermal conductivity; these factors must be taken into consideration where elevated temperatures are encountered. Another outstanding and marked characteristic is the nonmagnetic nature of such materials.

It is quite clear that the service conditions should be thoroughly explored with a view to determining whether the corroding influences at work are such that the steels can be reasonably expected to give a good account of themselves. In the first place the advisability of supplementing laboratory corrosive tests by actual works tests cannot be emphasized too strongly. This is necessary because, in manufacturing processes and under service conditions generally, it is only rarely that pure substances are used, and small amounts of impurities may make a big difference to the corrosion resistance of the steel. For example, in the manufacture of some organic acids, relatively small amounts of mineral acids are also present at times and this may quite easily lead to corrosion. It must not be imagined, however, that small or even large amounts of impurities are always harmful to the steel: they may even be beneficial. To illustrate this, copper sulphate or ferric sulphate when present in certain proportions has the power of preventing the solution of austenitic chromium-nickel steel in solutions of sulphuric acid. Such conditions exist in certain mine waters.

This point is also brought out by the corrosion of certain types of stainless chromium steel in acetic acid solution of the same strength as vinegar and in citric acid solution of the same strength as lemon juice, while remaining totally unaffected by actual vinegar and lemon juice, thus once more illustrating the modification in corrosion resistance brought about by small amounts of an impurity. Substances which may cause corrosion when boiling under normal pressure may be quite harmless if boiled under reduced pressure at a correspondingly lower temperature.

Correct heat treatment is very important. One of the things which has to be aimed at in producing a corrosion-resistant material is homogeneity and incorrect heat treatment may easily destroy this, with consequent setting up of electrolytic corrosion.

#### Heat-Resisting Steels

Demand is being made for steel of such a nature that its strength does not become impaired as the temperature rises. Ordinary steels have already lost a substantial proportion of their strength when they attain temperatures in excess of a black heat, i.e., 500 to 600 deg. C. While alloys of nickel and chromium have been very successful both in America and Europe, it has been found that, by suitably modifying the composition, the weakening is postponed until very much higher temperatures. In a good heat-resisting steel, however, this maintenance of strength at higher temperatures must be accompanied by resistance to scaling.

In the Campbell Memorial Lecture given earlier in the month before the American Society for Steel Treating the author showed how both characteristics can be controlled. While high-chromium, chromium-nickel and chromium-silicon steels show the advantage from a scaling point of view, the strength at high temperatures is not particularly good, whereas in the case of nickel-chromium steels to which

tungsten or silicon has been added (particularly the former) great gain in strength is obtained without impairing the resistance to scaling.

#### Theory of Corrosion

Why does iron rust? May it not be that iron protects itself by immediately forming the protective film when brought in contact with certain oxidizing media, and that failure to resist, i.e., progressive "oxidation," results from the puncturing and local destruction of this film through various causes, such as the presence of particles of foreign matter leading to damage through local electrolytic effects and from local concentration of corroding media in dew effects? Incidentally a continuous protective film presupposes a continuous metallic surface for it to form upon, and what with the dispersion of oxide or silicate inclusions of indeterminate composition, and the actual unsoundness of the bulk steel produced, it cannot be considered that such a condition is fulfilled. The author is of the opinion that even ordinary commercial steel can, in itself, be much improved as regards its resistance to corrosion by manufacturing materials free from oxides and gas holes.

In reheating and during rolling, the external oxide layer is formed upon the steel; and attention to the time-temperature effect, coupled with control of the nature of the furnace atmosphere, cannot be without influence upon the characteristics of the surface as regards resistance to attack.

It is difficult to be certain as to the cause of pitting corrosion in all cases, but it seems reasonable to assume that the two conditions required are, firstly, a medium which either does not, or which only just attacks the chief constituent of the metal when pure and under anaerobic conditions, and, secondly, some factor or factors leading to local acceleration of attack. If the first condition is not satisfied, any tendency to pitting will be more or less masked by general attack; and if the second does not apply, the attack will be even. It remains to fix the cause or causes of the local acceleration, and the following, in the light of present knowledge, are suggested as probable:

1. Small areas less accessible to oxygen than the surrounding material will become anodic to the rest of the material, and a condition favorable to pitting will exist. Small surface defects and extraneous foreign bodies may cause trouble in this way.
2. If a metal is normally covered by a protective oxide film, small defects in this film, however caused, may produce local decrease in resistance, leading to pitting.
3. Local concentration of corroding medium (moist crystals, etc.).
4. If a material has small areas differing in some way, either chemically or physically, from the mass of the material, then such areas may supply the accelerating force by electro-chemical means, if they are not so chemically resistant to the medium.

The influence of chromium is now believed to be that of producing the necessary resistance through the spontaneous creation of a satisfactory oxygen-containing passivity-producing film, thus bringing the resistance of these new steels into association with the old phenomenon of passivity, and it is the facility of the chromium of producing, by oxidation through atmospheric and like oxidizing influences, the protective film, which is the explanation of their excellent properties.

#### Magnetic Changes in Fatigue Specimens

M. F. Fischer reports his studies on the magnetic properties of steel during alternating stresses in the *Bureau of Standards Journal of Research* for November. While magnetic changes were observed, they appear to be due to relief of internal stress, and are of such magnitude as to obscure those magnetic changes directly resulting from a fatigue crack. He concludes, therefore, that a rapid method of determining the endurance limit by means of magnetic analysis cannot be expected.

# Blooms Routed in Four Directions

Special Transfer Table Handles Large Quantities According to Analysis in New Tube Plant

**Q**UANTITY production of alloy steels covering a wide variation in analyses involves several problems in the routing and treatment of material. Having once reached the bloom stage, different steels require different treatments before further processing. This gives rise to problems concerning the most economical method of routing large quantities of material, coming from a single source, to any one of several destinations.

For example, in the new plant of the Timken Steel & Tube Co., Canton, Ohio, blooms coming from the shear must be routed, according to analysis, directly to the next rolling operation in the 28-in. mill, to continuous reheating furnaces, to thermal conditioning pits, or to a point where they can be pickled and ground, or chipped, before reheating and rolling. In other words, large quantities of material

coming from one operation must be diverted to any one of four others, with as little possible obstruction to the production stream, either preceding, or subsequently.

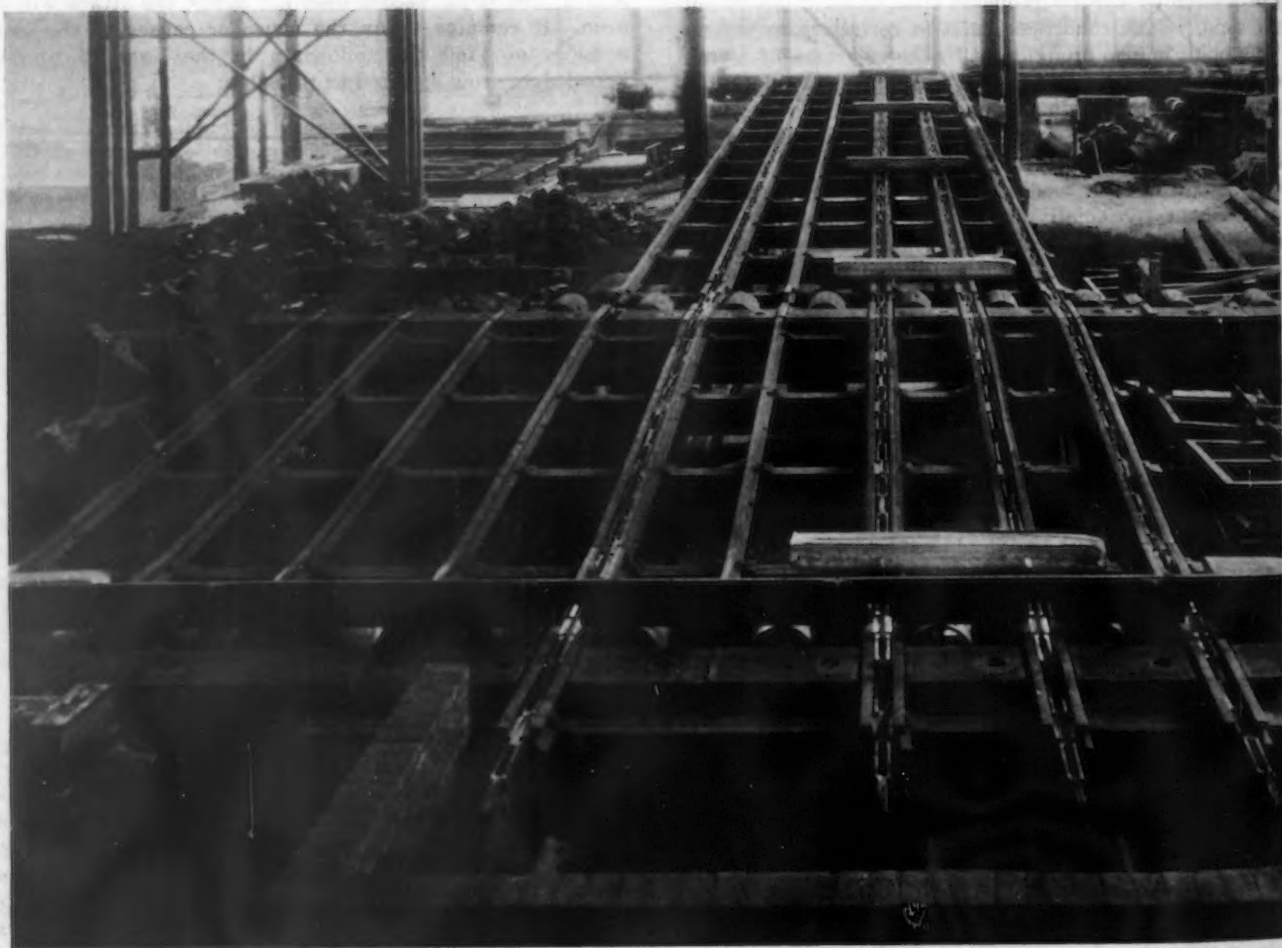
In this particular case the solution has been arrived at by means of a chain transfer table. The table, which has an overall length of 81 ft., and a width sufficient to accommodate either two rows of 9-ft. blooms, or a single row of 18-ft. blooms, was built with special regard to the service desired. It is located at right angles to the shear runout table, so that it can handle all blooms coming from the shear, regardless of their ultimate destination.

## Table Is Simply Constructed

The construction of the table proper is simple. It consists of a series of heavy rails, acting as skids, supported by a structural steel framework con-

sisting of heavy transverse channel members about 6 ft. apart, which in turn are supported at the ends by structural uprights, which, for greater rigidity, are braced by cross members extending from the top of one column to the base of the adjacent ones on each side. Further rigidity is given to the individual supports by gusset plates at the joining angle of the transverse and upright members. The table has a total rise of 6 ft. from the charging to the discharge end, with a level point about 15 ft. from the end nearest the hot shear, where the runout table leading to the 28-in. mill is located. This arrangement gives the operator a clear view of the blooms on the table during the whole course of their travel over it, from his pulpit over the charging end.

Bloom travel is accomplished by four endless chains, provided with carrying dogs, which extend 4 in.



*Transfer Table From the Operator's Control Station*



above the surface of the skid rails. The chains are driven from four sprockets mounted on a common shaft at the delivery end of the table, and run over four spring sheave take-up sprockets at the shear table end. The drive consists of a 90-hp. 220-volt compound wound, mill type motor, which drives the sprocket shaft through a reduction unit which gives a chain speed of 150 ft. per min. The motor is provided with a solenoid brake to insure quick stopping when blooms are to be spotted on the run-out tables that deliver them to various destinations.

The four sprockets at the drive end are mounted on a common shaft, which is coupled directly to the main gear shaft of the reduction unit. The sprocket shaft in reality consists of two sections of about equal length, coupled together. Thus either section may be removed, if desired, without disturbing the rest of the assembly. The shaft is supported by five pillow blocks, so located as to give it the greatest possible rigidity. They are equipped with roller bearings. The

mountings are simple, the two bearing cones being pressed on the shaft, and the cups located by a shoulder on the inside of the plate which forms the outer closure, adjustment being obtained by means of shims. The pinion and gear shafts of the reduction unit are also mounted in roller bearings.

The mounting of the take-up sprocket bearings is quite different. The sprocket bearings are located inside the sprocket hub proper, the cups being pressed against shoulders inside the hub, and the cones given a light fit on the shaft. The cones are located by a sleeve which fits around the shaft inside the square sliding block, and are locked in place by nuts on the end of the shaft. The outer closure is formed by a collar on the shaft, that is held against the hub by the outer block.

#### Operation Is Controlled from One Point

The whole operation, not only of the transfer table, but of the two runout tables connected with it, is

controlled from one point near the juncture of the table with the shear runout table. Thus it is possible for one operator to route blooms coming from the shear to any one of three destinations, according to the treatment they require.

Those intended for rolling without treatment can be sent directly to the rolling mill by a live roll table which crosses the transfer table at a point about 15 ft. from its beginning. Those which require reheating travel to a second live roll table located at the extreme end of the transfer table, which carries them to the entrance of the reheating furnaces. And those which are to be thermally conditioned, or chipped, are carried over the end of the transfer table, and deposited in cradles in which they are carried by cranes to their ultimate destinations. The proper handling of blooms is facilitated by the fact that the operator has a clear view of the whole table from his control station, and can act immediately in accordance with the demands of any situation that may arise.

## American Companies to Use Krupp Patent

### Ludlum, Firth Sterling and Central Alloy Will Cooperate With German Company in Promoting Chrome Nickel Alloy

**A**N announcement has been made by representatives of the Krupp Steel Works, Essen, Germany, of the formation of the Krupp Nirosta Co., Inc., which will be the agent in the United States for the Krupp interests, in cooperation with the Ludlum Steel Co., the Firth Sterling Steel Co. and the Central Alloy Steel Corporation, in the production and promotion of chrome nickel alloy.

The announcement was made by Rudolf Preussing and Heinrich Artz, directors of the Krupp Steel Works, before they sailed for Germany on Nov. 1, following their attendance at the fall meeting of the American Iron and Steel Institute.

"The main object of the Krupp Nirosta Co., Inc.," a statement read, "is not to act simply as a patent holding company, but to be helpful as a service company and as a medium for the exchange of helpful ideas along the lines of development. Arrangements have been made so that the licensees, including the Central Alloy Steel Corporation of Massillon, Ohio; the Firth Sterling Steel Co. of McKeesport, Pa., the Ludlum Steel Co. and others will have an important voice in the direction of its affairs."

The executive committee of the new company consists of J. M. Schlendorf, vice-president Central Alloy Steel Corporation; H. G. Batcheller, vice-president Ludlum Steel Co.; Richard Prosser and Otto van Schrenk. Edwin Corning, president of Ludlum Steel Co., will be chairman of the board and Mr. Batcheller will be president. The directorate will include F. J.

Griffiths, chairman Central Alloy Corporation; Henry E. Cooper, vice-president Equitable Trust Co., New York, and Harold O. Baker of the New York Stock Exchange firm of Jesup & Lamont.

Announcement was also made by the Krupp representatives of the arrangement made with the General Electric Co. for the manufacture in the United States of carbonyl.

H. G. Batcheller, president Krupp Nirosta Co., says that the Ludlum Steel Co. has taken an active part in the formation of the new company because of a belief that concerted action is necessary for the proper development of the chrome nickel alloy to which the Krupp laboratories have so largely contributed.

"For several years," he adds, "we have been interested in the production of the alloy steels, which for lack of a better term are usually described as 'stainless steel.' We have done a great deal of work with the alloys described by Brearley, Strauss, Armstrong and others. The more we study the corrosion resistant problem, the more we become convinced that there is need for great improvement in production methods and that the best results can only be secured by giving great attention to the selection of the proper alloy for each specific purpose. It has also been our experience that such selection must be based not only on complete laboratory tests, but in many instances on actual service tests.

"Several months ago we received an invitation from the Krupp company to send one of our metallurgists to in-

spect its plant and laboratories at Essen. We were much impressed by the remarkable development in Germany of the chrome nickel alloys in which the Krupps have specialized, and we also received many helpful suggestions regarding methods of production.

"Until the happy day arrives when the metallurgists discover an alloy that will cover the whole field of corrosion resistance, we believe that free exchange of ideas is necessary between the various mills producing the several alloys that have come into common use and we hope that the formation of the Krupp Nirosta Co. will represent an important step in this direction."

The Firth Sterling Steel Co. states that its cooperation in the formation of the Krupp Nirosta Co. will enable it to manufacture in this country a type of stainless steel similar to the "Staybrite" steel made for a number of years by Thomas Firth & Sons, Ltd., Sheffield, England.

"This 'Staybrite' type," says the Firth Sterling company, "is highly resistant to the corrosive effects of some of the agencies which affect to a greater or less extent our other stainless steels. The Krupp Nirosta Co.'s patents cover this type of material.

"The other arrangement made between Krupp's representatives and the General Electric Co. covers a new cutting material, and under the arrangement we shall now be able to put on the market our 'Dimondite,' which has a cutting capacity far in excess of any high-speed steel. We expect to announce shortly the details of this new development on which our laboratory has been working for some time, but the marketing of which has been delayed owing to the fact that basic patents were held by Krupps and the General Electric Co."

## Surface Grinder Equipped with Oilgear Feed

**G**RAND RAPIDS No. 5 hydraulic feed surface grinder equipped with Oilgear feed has been designed by Gallmeyer & Livingston Co., Grand Rapids, Mich., to provide more rapid means of doing extremely accurate

movable pointer can be set for convenient readings.

When it is desired to get very accurate readings for grinding to close limits, the fine adjustment comes into play. Turning the smaller hand-wheel



***F**EEDS Up to 55 Ft. per Min. Are Obtainable by Turning a Handle at the Front of the Machine (at Left)*

***T**HIS Steel Frame Shear (at Right) Cuts 3-in. Angles and Weighs 93 Lb.*

work. As gearing of every nature has been eliminated in the movement of the saddle and table, the ground surface cannot show "gear tooth marks." The Oilgear mechanism makes possible practically any longitudinal table speed up to 55 ft. a minute. The feeds may be set so that the entire working surface of the table will be covered in 3½ min.; on the other hand, they may be set so slow that it will take 9 hr. to cover the same surface.

Rigid foundation is provided by a one-piece base casting, which weighs over 1600 lb. The spindle head is a heavy casting fitted to the vertical ways and carrying an extra heavy spindle with a minimum of overhang for the wheel. The spindle runs in heavy bronze bearings, the front being 2 in. in diameter by 8 in. long and the rear 1¾ in. in diameter by 5 in. long.

The cross-feed engine may be set to operate at both ends of the reciprocating table stroke or at one end only. It may feed either in or out. The machine may be driven by belt with countershaft or by motor with self-contained drive. It may be arranged for either wet or dry grinding.

Aside from the method of operating the table, the most unique feature is in raising and lowering the wheel head. For rapid adjustment in raising or lowering a considerable distance a large hand-wheel is used. This gives direct action to the elevating screw through a worm and worm gear. The wheel is graduated to 0.00025 in. The

or knurled hand knob in the center of the large hand-wheel provides a back-gear action to the elevating mechanism. The graduated dial ring on the disk in the center of the hand-wheel can be set at zero with relation to the pointer. Both inner and outer wheels turn, but the graduations on the inner wheel read on this pointer with vernier effect. By this means, readings of adjustment may be made in tenths of a thousandth, successive graduation marks being over ¼ in. apart.

This size of machine has a table with working surface 10 x 36 in. The automatic table travel is 12 in. transverse and 38 in. longitudinal. Vertical movement of the wheel head is 13¾ in., while maximum distance from wheel to table varies from 12¼ in. under a 10-in. wheel to 13¾ in. under a 7-in. wheel—the minimum size recommended. A motor of 5 hp. is standard. The net weight of the machine with motor, but without accessories or liquid, is 4250 lb.

A code for testing water cooling equipment, such as cooling towers and spray installations, has been drafted by the committee on power test codes of the American Society of Mechanical Engineers and will be presented at a public hearing to be held at the headquarters of the society in New York, Dec. 4, at 2 p. m. Copy of the tentative code may be obtained from C. B. Le Page, 29 West Thirty-ninth Street, New York.

## Angle Shear is Operated by Hand

**H**AND-OPERATED and made with a steel-frame, the angle shear here shown is designed to be light in weight. It is built by the Hendley & Whittemore Co., Beloit, Wis. It will shear angles up to 3 x ¼-in. or 2½ x ⅝-in. It is 14¾-in. high, 15-in. wide, 7½-in. deep and it weighs 93 lb. without the operating lever.

The shear is provided with two eccentrics and it can be operated either directly, with the hand lever applied to the main eccentric, so that light angles are cut off in one stroke; or it can be operated through the compound leverage, so that heavy angles can be cut with minimum effort. The eccentrics are packed in grease. Shear blades and eccentrics are made of hardened tool steel.

When operated through the compound leverage the hand lever is worked up and down without being



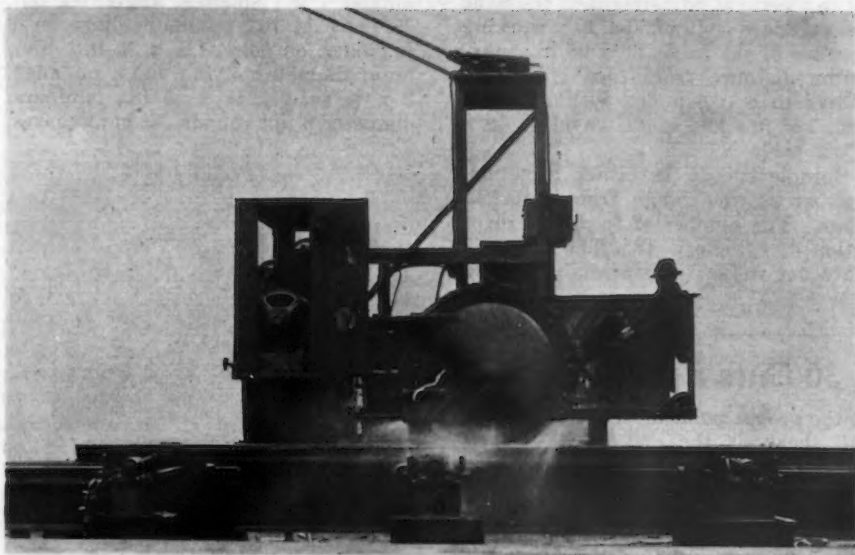
detached or moved from one socket to another. Dogs are provided to take up slack between each stroke and to hold all the cut gained by each stroke.

## Paint for Zinc Coatings

A paint for galvanized iron known as "Gun Metal Liquid" is being marketed by Liquid Metal Products, Inc., 231 South La Salle Street, Chicago. It is said to bond instantly with newly galvanized metal, and produce a surface which is corrosion resistant in itself. At the same time it may serve as an undercoat for other paint. It may also be used on metal advertising signs, as paste adheres to it firmly.

A concession for chromium mines at Eski-Shehir and vicinity, Turkey, is being sought by Swedish interests. The ore runs 43 to 50 per cent metal and the bed is crossed by the Anatolian railroad, which is expected to help reduce the cost of mining.





### Adapts Friction Saw for Longitudinal Cutting

**I**N making guard rails the Interborough Rapid Transit Co., New York, employs the special high-speed friction saw illustrated, which is arranged to cut a strip 33 ft. long from a portion of the base of discarded 100-lb. standard rails.

The machine was built by Joseph T. Ryerson & Son, Inc., Chicago. A 56-in. diameter,  $\frac{1}{4}$ -in. thick, special steel friction saw blade is used, and cutting is at the rate of  $4\frac{1}{2}$  to  $6\frac{1}{2}$  ft. per min., depending upon the speed

of the feed motor employed. It is stated that a clean cut is made through the entire length of the rail in 5 to 7 min.

The machine has an arc welded steel frame and runway upon which the saw carriage travels. The carriage, also arc welded, carries the 100-hp. friction-saw motor and blade, as well as the 3-hp. motor and reduction unit for propelling the carriage back and forth on the runway. A 70-gal. pump driven by a  $7\frac{1}{2}$ -hp. motor supplies

water at 150 lb. pressure for cooling the blade. As the machine moves back and forth on the runway, the pump picks up water from a trough at the side of the frame. Water from the saw blade is collected by a concrete installation and returned to the trough through a system of baffle plates.

The operating power, direct current varying from 550 to 650 volts, is taken from two overhead poles. Two trolley poles are employed so that the machine itself is not used as a return for the motor current. With this arrangement the motor bearings and other movable parts of the machine are not required to carry the current and the possibility of accident is avoided. The machine itself is grounded but a separate return wire from the motor carries the current back to the overhead trolley.

Rails to be cut are held by means of five individual air clamps which are arranged so that the rails can be pulled down into them from skids without the assistance of overhead crane equipment. Rollers are provided on the skids so that the rail can be moved forward or backward after the cut to remove it from the clamps. The clamps are powerful enough to straighten the rail during the cutting operation. The operator rides along on the carriage, from which he can watch the work conveniently. All controls are located within easy reach from the operating position.

### Horizontal Boring, Drilling and Milling Machine

**A** NEW table type horizontal boring, drilling and milling machine, designated as the No. 50, of increased range and capacity, has been brought out by the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

The bed is of massive box-type construction, the weight of the standard bed being in excess of 15,000 lb. The ways are 13 in. wide, are relieved in the center, and measure 48 in. over the outer edges. The Giddings & Lewis method of bolting, tonguing and doweling the column to the bed unit has been employed on this machine, a large tongue being machined integral with the bed for this purpose. The column is of heavy box section, well ribbed in both directions.

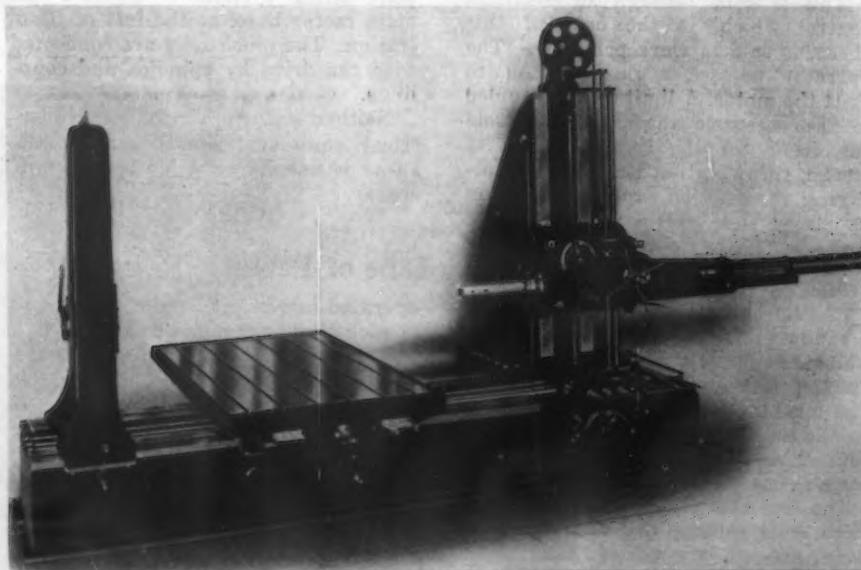
Although considerably heavier, the table and saddle unit is of the same general design as that of the company's No. 45 machine. For making adjustments between the table and the saddle two taper gibs are provided, one at each end. The screw for cross feed of the table is mounted on ball bearings and is arranged with adjustable graduated dials on each end. The Bowen system of lubrication is standard equipment for oiling the ways, gears and bearings of this unit. One stroke of the plunger supplies lubricant to all parts, regardless of the position of the table.

The spindle head is massively built and the main casting is of one piece to

furnish solid support for all moving parts. The head unit has been made compact to permit close observation of small work. This unit is automatically lubricated, a constant flow of oil being furnished to all parts by a positive-driven pump located in the head.

Speeds and feeds are obtained through sliding gears and jaw clutches

contained in separate units mounted on the bed and running in oil. Changes in speed and feed are accomplished through levers, easily accessible from the normal operating positions. All gears are of chrome-nickel steel, case hardened, are of wide face and have the teeth rounded to facilitate meshing. Bevel gears in the speed train are of spiral tooth form. The main



*Increased Range and Capacity Are Features of the New Machine*

shafts of the speed box are mounted in ball bearings. Power is furnished to the machine through two "twin disk" friction clutches, which makes the machine adapted to tapping operations. A gear change quadrant is included in the feed gear train so positive leads can be had for tapping and threading. The machine can also be supplied with the G&L precision measuring device.

Some of the principal specifications are: Longitudinal travel of spindle,

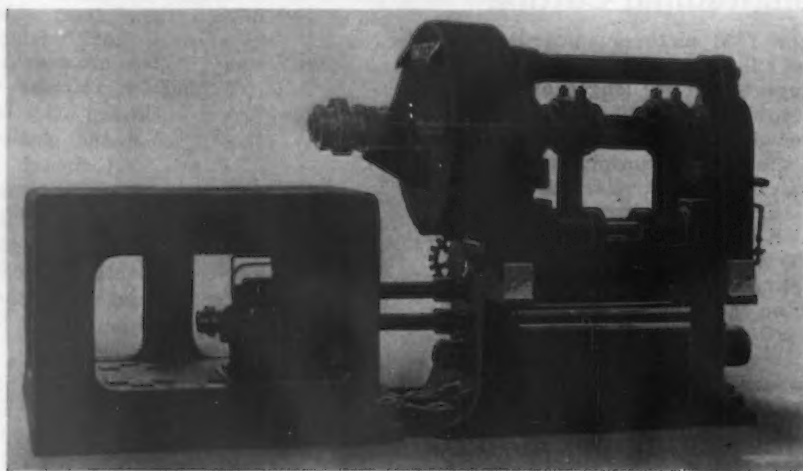
64 in.; vertical adjustment of the head on standard column, 64 in.; working surface of the table, 60 x 96 in.; maximum distance from face of spindle sleeve to end support with standard bed, 120 in.; and cross travel of 60 x 96-in. table, 86 in.

Spindle speeds, in either direction, number 24 and range from 5 to 245 r.p.m. The number of feeds per revolution of spindle is 18. The approximate net weight of machine is 45,500 lb.

## Hot Strip Shear Makes 30 Cuts a Minute

**A** DIRECT-CONNECTED hot strip shear, which exerts a pressure of 250,000 lb. between the knives and is designed to cut a hot steel strip 48 in. wide by  $\frac{1}{4}$  in. thick, is a late development of the United Engineering & Foundry Co., Pittsburgh. It has a

at the proper point in the cycle to stop the shear at the end of its return stroke. The top knife block, which is operated through an eccentric shaft and pitmans, has adjustable bronze shoes for taking up the wear in the housing slides. The drive, entirely in-



*Each Cut on This Shear Is Made by Starting the Motor, Which Stops After the Cut Has Been Made*

stroke of  $3\frac{1}{2}$  in. and is geared to run at a speed of 30 cuts a minute. "Direct-connected" means that no clutch is used; the motor is connected by a flexible coupling direct to the drive, each cut being made by starting and stopping the motor.

This is done through an electrical control which, in the case of this shear, is said to work perfectly. The operator presses a push button to start the motor. A limit switch coupled to the eccentric shaft then controls the shear for the remainder of its stroke, throwing out the coils and allowing the friction brake to function

closed, is provided with continuous oiling.

Motor-driven pinch rolls, controlled by a solenoid, are placed on the entering side of the shear. The drive for these pinch rolls, also entirely inclosed and connected with the continuous oiling system, is beneath the main motor base, at the left of illustration. The pinch rolls are connected with the drive by spindles and couplings.

Neither motor is shown, as all electrical equipment for operating the shear is usually supplied by the purchaser.

## Adds Small Machine to Line of Bending Rolls

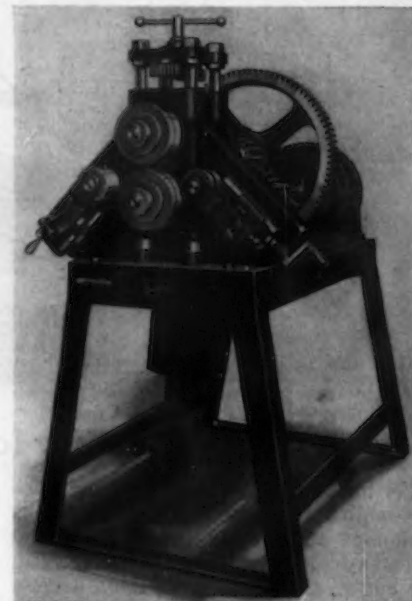
**R**APID operation is a feature of a new vertical type bending roll which has been placed on the market by the Buffalo Forge Co., Buffalo. The machine is designated as the No. 0, and is the smallest of a line of similar machines made by the company.

The frame of the machine is a one-piece steel casting and the legs and table are of arc-welded steel construction. The rolls may be adjusted conveniently by means of three hand-

operated cranks, and the arrangement is such that they may be changed in a few seconds. Bronze bushings are employed throughout and lubrication is by means of the Zerk system. A quick-acting clutch facilitates operation. For motor drive a 2-hp. 1200-r.p.m. motor, with switch box and push-button control, is used. The machine can be arranged also for belt drive.

Capacities are as follows: Angles, leg out,  $1\frac{1}{4}$  x  $\frac{3}{16}$  in., minimum di-

ameter 7 in.; smallest angle, leg out,  $\frac{1}{2}$  in. x  $\frac{1}{8}$  in., minimum diameter 6 in.; flats, on edge,  $1\frac{1}{2}$  x  $\frac{3}{8}$  in., minimum diameter 7 in.; flats, on edge, 2 x  $\frac{3}{8}$  in. to  $2\frac{1}{2}$  x  $\frac{1}{2}$  in., minimum diameter 6 in.; rounds,  $\frac{3}{8}$  in.; squares,



*The Frame Is a Steel Casting and the Legs and Table of Arc Welded Steel*

11/16 in., minimum diameter 6 in.; copper tubes, No. 12 gage, 1 in.; copper tubes, No. 16 gage,  $1\frac{1}{4}$  in.; standard pipe,  $\frac{3}{4}$  in., minimum diameter 6 in.

The length of the machine is 3 ft. 10 in. and the width and height are 2 ft. 6 in. The weight is 75 lb.

## Portable Grinder with $\frac{1}{2}$ -Hp. Motor

**ONE-HALF** horse-power portable grinders and buffers, equipped with ball bearing motor and Timken roller bearing grinding spindle, have been added to its line of electrical portable tools by the Hisey-Wolf Machine Co., Cincinnati. They are built for 110 and 220-volt current supplies,



*Portable Grinder Carries 6-In Wheel*

and for 1-phase or 2-phase currents as well as direct current. The size of wheel taken is 6 x  $1\frac{1}{4}$  in., with a  $\frac{3}{4}$ -in. hole.

Employment in the metals industry in the Middle West showed an increase, but employment on the whole showed little change for the period of Aug. 15 to Sept. 15, according to a report by the Federal Reserve Bank of Chicago. The metals group showed an increase of 1.9 per cent in the number of workers, whose earnings increased 1.2 per cent.



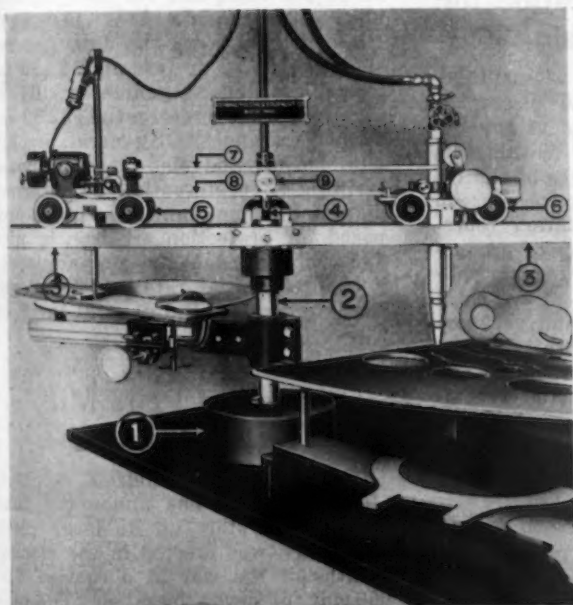
## Two New Oxy-Acetylene Shape Cutters

**T**WO new devices for cutting irregular shapes in steel plate have recently been placed on the market. One is introduced by the Linde Air Products Co., New York, and known as the Oxweld shape-cutter. Speed ranges from 3 to 20 linear in. per min. depending on the thickness of the metal being cut; and it is said that accurate, smooth cuts requiring a minimum of machining can be made in slabs 12 in. thick. In this machine the cutting blowpipe is mounted on a carriage which is moved in any desired direction by means of an electric motor. For routine production it will operate automatically from templates made of strip metal. The driving mechanism is similar to one illustrated to greater scale in *THE IRON AGE*, Aug. 30, page 521. Where only a few parts are to be cut out, a hand tracing device can be attached and used to follow the outline of a full sized sketch or blueprint.

Another device which is designed to minimize lost motion in transmitting the required direction to the cut-

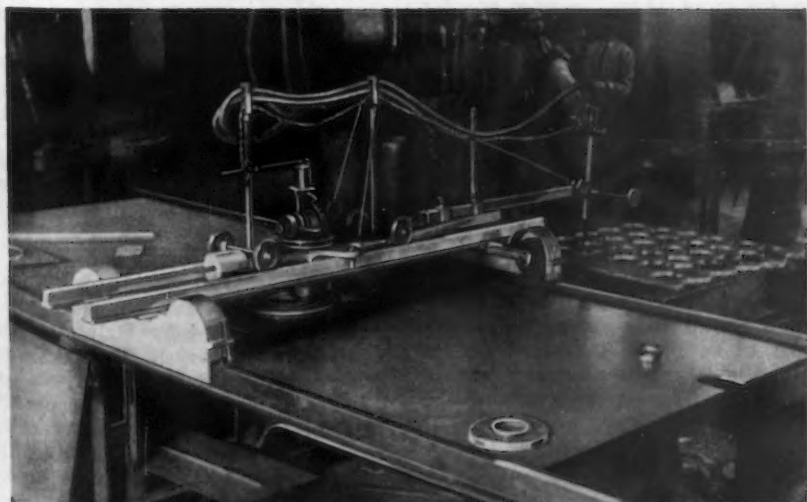
ting blowpipe has been recently developed by General Welding & Equipment Co., Boston. A substantial base 1 and a short column 2 support a well balanced track system 3. By means of a roller and ball bearing system it can easily turn around this column. On this track are mounted two carriages 5 and 6 of equal weight, one carrying in its center the tracing and driving element and the other the cutting torch. The carriage centers are set equidistant from the main center, and two racks 7 and 8 engaging a gearwheel 9 will always keep the carriages equidistant from center when moving in and out.

The combination of the straight movement of the carriages with the turning movement of the track system enables the tracer to follow any path, which in turn compels the tool to reproduce this same movement correctly. By running the long racks over two coupled gearwheels of different diameters, the machine can proportionally enlarge or reduce the pattern to any desired proportion.



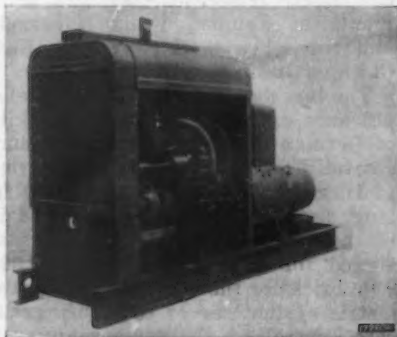
***THE General**  
Welding & Equip-  
ment Co. Cutting  
Machine Has a Rack  
and Pinion Drive*

***O**XWELD Shape  
Cutter Auto-  
matically Drives  
Oxy-Acetylene Blow-  
pipe Around Any  
Full Sized Pattern  
(Below)*



## Compact Welding Set for Isolated Service

**A** SELF-CONTAINED gas engine-driven arc welding set, designed particularly for pipe line construction, structural steel work, railroad con-



*Welding Set Mounted on Skids, for Field Service*

struction and general welding service in isolated places where electric power is not available, is a late Westinghouse development. Its overall dimensions are: length, 73 in.; width, 25 in.; height, 46½ in. The approximate net weight is 1700 lb.

The complete set consists of a model P-20 Continental gas engine, direct-connected with a new type Westinghouse 200-amp. arc welding generator, with direct-connected exciter overhung from the generator bracket. To provide greater compactness, the generator has a special bracket which fits into the engine housing. Protective covers over the generator, commutator and engine head make the complete equipment weather proof without a canopy. The engine and generator, complete with all controls, are mounted on an all-welded channel base. The equipment may be made suitable for either stationary or portable use.

The four-cylinder engine is rated at 24 b.h.p. at 1450 r.p.m., the generator speed. A Zenith carburetor with friction-type choke is operated by a positive centrifugal-type governor. The lubricating system is pressure fed by a gear-type pump. A centrifugal water pump and liberal radiator capacity provide efficient cooling.

The generator is a special type S.K., constant current, differentially compound wound machine. It is rated at 200 amp., 1 hr., 50 deg. C. rise, on a resistance load at 25 volts, in accordance with N.E.M.A. standard practice. The field rheostat, ammeter and voltmeter are all mounted in a control cabinet on top of the generator frame. The welding range is from 60 to 300 amp.

For determining the condition of acid pickling tanks, an inexpensive device known as the H. K. chemical test set is being marketed by the Research Mfg. Co. of the Ellwood Ivins' Tube Works, Oak Lane Station, Philadelphia.

## Harbison-Walker Make Plant Improvements

During the past year the Harbison-Walker Refractories Co. embarked upon an extensive building program which will require several years for completion. Three plants have been completely remodeled, the clay brick plants at Templeton and Clearfield and the silica brick works at East Chicago, Ind.

The last mentioned is of special significance, in that it has a tunnel kiln of German design that has been successfully used in burning silica brick at Düsseldorf, Germany. It is 550 ft. long, fired with producer gas, and is of the regenerative type. It was designed for a daily output of 30,000 9-in. bricks or the equivalent. A pyrometric system serves to secure accurate control of the temperatures in every part of the kiln. A large proportion of the brick in this plant is made in a machine especially designed for the molding of silica brick.

At the Templeton and Clearfield works there are two 444-ft. Dressler open-fire tunnel kilns at each plant, together with Boyd presses, remodeled grinding, screening and storage units and wet pans with a new type of disintegrators to prepare clay for the presses. The plants have been electrified, with speed reducers for elevators, conveyors and car pullers, and equipped with overhead monorail for handling coal and ashes, automatic stokers for firing coal, and vacuum cleaners for cleaning kiln cars.

## To Build New Brass Plant in Cleveland

Chase Brass & Copper Co., Waterbury, Conn., will erect a brass and copper manufacturing plant in Cleveland to supply its mid-Western trade. This company produces brass pipe, sheets, rods, wire tubing and other brass and copper products and distributes these products through a system of warehouses, one of which is located in Cleveland.

## Scrap Institute Continues Organizing Chapters

An international organization of scrap iron dealers was urged by Henry Rothschild, senior member of J. Adler, Jr., Inc., large German dealers, at a meeting of the New York chapter of the Institute of Scrap Iron and Steel, at the Hotel Astor, Oct. 30. Mr. Rothschild said that the scrap iron dealer of Germany was the first to resume business relations with the former enemy countries, because of the necessity of providing the basic material for the steel mills. He said that the Institute of Scrap Iron and Steel might be used as the basis of formation of such an international organization.

At a meeting of New Jersey scrap iron and steel dealers in Newark, N.

J., Oct. 29, a fifth chapter of the institute was organized with Michael V. Bonomo, Schiavone & Bonomo Brothers, Jersey City, president, and A. Isaac, Elizabeth, N. J., chairman of the executive committee.

## Chase Company to Build Cleveland Mill

The Chase Brass & Copper Co., Waterbury, Conn., has selected Cleveland as the site of a brass and copper plant to serve the Midwestern territory, according to an announcement by F. S. Chase, president. Suitable location has been secured and the first buildings of a brass mill will be erected shortly. The Chase company acquired the U. T. Hungerford Brass & Copper Co. in 1927 and the Ohio Brass & Copper Co. a few months ago. New warehouses have been added from time to time and new Cleveland mill will be located to serve them more promptly with manufactured products.

## To Vote Simplification for Welded Chain

A general conference of manufacturers, distributors and users of welded chain will be held at the Department of Commerce, Washington, Nov. 15, under the auspices of the Division of Simplified Practice, Bureau of Standards. Manufacturers representing a large percentage of production have formulated a program calling for a reduction of about one-third in the number of sizes and varieties now catalogued. The conference will be held to act upon the proposals and to adopt a simplified practice recommendation. R. L. Lockwood, of the Division of Simplified Practice, will represent the Department of Commerce.

## Railroad Bearing Bronzes Studied by Standards

To simplify specifications for railroad bearing bronzes and to study the properties of those bearing bronzes, an investigation was undertaken at the Bureau of Standards of the wear and mechanical properties of the bronzes at various temperatures. Results show that no one of the selected laboratory tests, consisting of wear, tension, impact and pounding, can be expected to yield information that is adequate for general comparisons.

The bronzes tested fall into certain general classes as regards wearing and mechanical properties, and each group shows superiority for certain types of service. As far as can be judged, existing specifications can be simplified. This simplification, it is urged, should include a reduction in the number of types with more generous limits in some cases in chemical compositions.

## Aluminum Cartel Continued for Three Years

The European aluminum cartel, formed in 1926 for a two-year period, has been prolonged for three years, implying endorsement of the organization and its advantages in price-fixing and production allocation, according to a report received by the Department of Commerce from W. T. Daugherty, trade commissioner at Berlin. The production, in metric tons, of member countries in 1927 and 1928 respectively is reported as follows: Germany, 27,400 and 29,600; Switzerland, 21,000 and 22,000; France, 25,000 and 24,000; Norway, 22,000 and 24,400; Great Britain, 7900 and 7300; Italy, 2000 and none.

## Canadian Tariff Plea Is Modified

The Algoma Steel Corporation, Sault Ste. Marie, Ont., has amended and somewhat modified its application for tariff protection. It now asks on flat spring steel a preferential tariff of 10 per cent, and for intermediate and general tariffs, 17½ per cent. On structural steel, the duty per ton suggested is \$2 preferential, \$2.75 intermediate and \$3 general tariff; on pig iron, \$1.50 preferential, \$2.50 intermediate and \$2.50 general; on billets, blooms and slabs, the proposed tariff is \$3 preferential, \$4 intermediate and \$5 general. New items proposed for protection are iron in pigs and iron kentledge; the company seeks a \$2 preferential rate and \$3.50 per ton intermediate and general tariff on these.

## Canadian Plate Mill to Be Operated

The Dominion Foundries & Steel, Hamilton, Ont., has announced that it will soon start up its large plate mill which was erected in the closing months of the war at a cost of \$1,000,000 but never operated. The mill has been completely renovated, and preparations for production on a large scale are nearly completed. The company plans to make the first delivery of plate on Nov. 15. The mill is one of the latest high-speed type. It is the only universal plate mill in Canada and is designed to roll also sheared plate and carbon or alloy blooms for re-rolling. Canadian users of steel spent \$5,000,000 in the United States for plates in the last fiscal year.

The Fort Pitt Spring & Mfg. Co., McKees Rocks, Pa., has been sold to interests headed by Ralph H. Tate, Pittsburgh, Henry S. Sherman, Cleveland, and C. H. Collins, New York. The name will be changed to Fort Pitt Spring Co. The new owners take over the plant Nov. 1, and William McBride, president, will retire on that date.



## Metals Lead in New England Manufacture

### Government Survey Shows That Such Lines Overshadowed Textiles in Values Added by Fabrication

INDUSTRIES in which metals are the principal material were of more significance to New England in 1925, as a source of income, than all the textile manufactures. The metals industries, including the various kinds of machinery, iron and steel, transportation equipment, nonferrous metals and jewelry, overshadowed textiles by \$138,353,000 in the value added by manufacture, and made up 31.9 per cent of the New England total. Omitting transportation equipment the difference is reduced to \$58,000,000.

This little recognized fact is pointed out in a survey of the New England marketing area which has just been completed and published by the Department of Commerce under the title of "New England Manufactures in the Nation's Commerce." The survey was initiated by and conducted with the cooperation of the New England Council.

The number of establishments in the metal and related industries is given as 3662, constituting 20.2 per cent of the total of the 18,173 New England establishments listed and exceeding any other line of industries. The cost of materials used by the metals industries was \$676,365,000, or 21 per cent of the total for New England. The value of products was \$1,613,126,000, or 26.2 per cent of the total, while the value added by manufacture was \$936,761,000, compared with \$798,408,000 added by manufacture in the textile industry whose cost of materials was \$1,212,488,000, or 37.6 per cent of the total. The value of textile products, which like the cost of the industry's materials, led all other values, was \$2,010,896,000, or 32.6 per cent of the total. The number of establishments in the textile industries was 2579.

Wage earners in the metals industries totaled 317,025 or 28.2 per cent of the total, while the payroll was \$427,183,000, or 31.9 per cent of the total. Wage earners in the textile industry exceeded those of any other industries, as did their aggregate income. The number was 412,544, or 36.8 per cent of the total, and the payroll amounted to \$435,736,000 or 32.5 per cent of the total.

#### Values Added by Manufacture in Metals Greater Than in Textiles

The figures on cost of materials disclose a conspicuous contrast between the metal industries and the textile group and bring out strikingly the difference in the expenditures for materials for fabricating the product in these two major groups. The total for metals was only slightly more than half the cost of the materials for the textile industries, yet the metals industries contributed considerably more to the New England in-

come from manufacturing than did the textiles. The value added by manufacture in the metal industries was considerably greater than its cost of materials, the latter representing about 42 per cent of the total product, while the value added in the process of manufacture was 58 per cent. With textiles the condition was reversed, the cost of materials being much greater than the value added by manufacture. Materials comprised about 60 per cent of the total value of the product, while the process of manufacture contributed only 40 per cent.

Director Julius Klein of the Bureau of Foreign and Domestic Commerce said that vigorous and intelligent application of greater precision and more scientific planning in business management will yield better profits for the producer, higher wages for the worker and an improved product for the consumer at a lower cost. Dr. Klein referred to what was termed the

### Iron and Steel Meeting at Chicago

A national iron and steel meeting is to be held at the Palmer House, Chicago, Nov. 14 and 15, under the auspices of the Iron and Steel Division of the American Society of Mechanical Engineers, George T. Snyder, chief engineer National Tube Co. at Lorain, Ohio, chairman. The program, which includes visits to several plants of the Chicago district, covers in part the following papers:

"Heat Economy Progress in Steel Mills," by F. H. Willcox, vice-president, and Gordon Fox, electrical engineer, Freyn Engineering Co., Chicago.

"Sheet Rolling," by Leon Cammen, consulting engineer, New York.

"Powdered Coal Cupolas," by D. H. Meloche, executive officer, American Radiator Co., New York.

"Hot Blast Cupola," by F. K. Vial, vice-president and chief engineer, Griffin Wheel Co., Chicago.

"Manufacture of Nickel Steel Plate," by Charles McKnight, development and research department, International Nickel Co., New York.

"Non-Ferrous Bearing Metals," by L. E. Christopher, Buckeye Brass & Mfg. Co., Cleveland.

"Lubrication of Steel Mill Equipment," by L. P. Tyler Vacuum Oil Co., Pittsburgh.

There will be a banquet on Wednesday evening, Nov. 14. The speakers announced at this writing are Prof. W. Trinks, Carnegie Institute of Technology, Pittsburgh, who will speak to "Some Observations on European and American Steel Plants," and H. V. Coes, Ford, Bacon & Davis, consulting engineers, New York, whose topic is "Taking Care of Depreciation and Obsolescence." The presiding officers

staggering losses in the nation's business from inefficient distribution, a figure estimated at approximately \$8,000,000,000 annually, representing about 20 per cent of the net value of the total manufacturing production of the United States.

The declared purpose of the New England and other marketing studies being carried on by the department is to develop, for the first time, the vitally important basic facts with which the business community, with the aid of the Government, can eliminate some of this enormous and unnecessary waste.

The income of the people of New England from manufacturing activity in 1925 was approximately 11 per cent of the total national income from this source, the total value contributed by all its manufacturing processes, outside of the cost of materials, having been \$2,936,153,000. This net income is to be distinguished from the gross value of all products of New England manufacture, including the cost of materials, the value of products having been \$6,161,009,000, and comprised 9.8 per cent of the gross value for the entire United States.

for the three technical sessions are: John W. Shepherdson, chief engineer Morgan Construction Co., Worcester; J. Fred Mowat, chief engineer Joliet Works, Illinois Steel Co., Joliet, Ill., and A. J. Boynton, vice-president H. A. Brassert & Co., consulting engineers, Chicago.

### To Direct the Institute of Weights and Measures

Nominations as follows have been made to fill eight vacancies on the council of the American Institute of Weights and Measures, 115 Broadway, New York, to serve until December, 1931:

C. R. Burt, vice-president, Pratt & Whitney Co., Hartford.

W. D. Faucette, American Railway Association and chief engineer, Seaboard Air Line Railway Co.

Fred A. Geler, president, Cincinnati Milling Machine Co.

Edwin M. Herr, president, Westinghouse Electric & Mfg. Co. and past president, American Manufacturers Export Association.

W. R. Ingalls, consulting mining engineer and past president, Mining and Metallurgical Society of America.

Henry M. Leland, past president, Society of Automotive Engineers.

Henry D. Sharpe, treasurer, Brown & Sharpe Mfg. Co.

H. Nelson Street, secretary, Retail Dry Goods Association of New York.

Twenty more cities within the past few weeks have announced their intention of establishing municipal airports, according to the Aeronautics Branch of the Department of Commerce.

## Mechanical Engineers to Hold Large Meeting

WITH more than 25 technical sessions covering all departments of mechanical engineering, the annual meeting of the American Society of Mechanical Engineers, which will be held at the Engineering Societies Building, New York, Dec. 3-7, will be of wide scope. The program is well balanced, with a wealth of timely material for both the plant executive and the designing engineer.

Machine shop practice will have a prominent place. A session will be devoted to presentation and discussion of a paper on the "Principles of Jig and Fixture Practice," by Prof. J. W. Roe, and there will be a symposium on methods of motor application and control. At the latter, four papers, devoted to motor application and control on lathes, planers, precision grinders and special drilling and tapping machinery, respectively, will be discussed. The third session, on finishes in the machine shop, will have a paper on "Carboloy and Tungsten Carbide Tools," by S. L. Hoyt, and another on "Mechanical Application of Chromium Plating," by W. Blum.

"Cooling and Lubrication of Cutting Tools," a report of the subcommittee of the A.S.M.E. special committee on cutting metals, will be one of three papers at a session on lubrication.

The progress report of the materials handling division of the society will be a feature of the first session under the auspices of that division. A second meeting, with six prepared papers, will be devoted to skid handling of interplant shipment.

Two management sessions will be held jointly with the American Management Association. "A Basis for Evaluating Manufacturing Operation," a paper by L. P. Alford and J. E. Hannum, will be a feature of one of these meetings, papers at the other being: "The Executive Function in Industry," by R. T. Kent; "Management Engineering in the Smaller Plant," by J. E. Dykstra; and "Outstanding Economic and Technical Factors Involved in Engineering of New Manufacturing Equipment," by J. R. Shea.

A paper on "Preliminary Findings of a Study of Intensive Types of Technical Education" will be presented by R. H. Spahr at a session devoted to education and training for the industries of non-college type.

Proper illumination will be discussed at a joint meeting of the A.S.M.E. and the Illuminating Engineering Society. Papers include: "Light as a Factor in Production," by C. C. Monroe and H. A. Cook; "Designing Buildings for Daylight," by H. H. Higbie and W. C. Randall; and "Artificial Lighting Provision in Building Design and Process Layout," by Ward Harrison.

An iron and steel session has been arranged by the iron and steel division of the society. In addition to a progress report of the work of the divi-

sion, a paper on "Heavy-Duty Anti-Friction Bearings," by S. G. Koon, will be discussed. "Effect of Alloying Elements Upon the Stability of Steel at Elevated Temperatures," by A. E. White and C. L. Clark, will be a feature of a meeting devoted to industrial power.

Two sessions will be held by the applied mechanics, hydraulic and railroad divisions, respectively. Other meetings will be devoted to mechanical springs, aeronautics, oil and gas power, fuels, central station power, boiler feed water studies, fluid meters, printing industries and wood industries. There will also be a joint meeting with the American Society of Refrigerating Engineers.

The business meeting, followed by open house, will be held on Monday evening, Dec. 3. The presidential reception and dance will be on Tuesday evening and the annual dinner, at the Hotel Astor, on the evening of Dec. 5. College reunions are scheduled for Thursday evening.

## Automotive Production Meeting in Detroit

AN unusually full program has been arranged for the production meeting of the Society of Automotive Engineers, which will be held at the Book-Cadillac Hotel, Nov. 22 and 23. Thirteen papers and seven committee reports will be presented at five technical sessions. There will also be two luncheon conferences, devoted to the selection and utilizing of machine tools and maintenance, respectively, and a production dinner meeting of the Detroit section of the S.A.E.

Papers at the first session include: "How the Ford Motor Co. Gets Its Phenomenally Low Production Costs," by John Younger, Ohio State Uni-

versity; "Production from the Accounting Point of View," by L. A. Baron, Stutz Motor Car Corporation of America, and "The Relation of Time Study to Manufacturing," by L. W. Haskell, Dodge Brothers, Inc.

"The Barnes Gear Shaver Process," by H. D. Tanner, Pratt & Whitney Co.; "Integral Contact Gearing," by A. B. Cox; and "Honing Progress," by C. G. Williams, Barnes Drill Co., are among the papers planned for the second session. At the production dinner, to be held on the evening of Nov. 22, addresses will be made by K. T. Keller, vice-president in charge of manufacturing Chrysler Corporation, and E. P. Blanchard, Bullard Machine Tool Co.

Materials handling will be discussed at the opening meeting of the second day, Nov. 23. Papers include: "Assembly Plant Layout for Material Handling," by N. H. Preble, Mechanical Handling Systems, Inc.; "Selection of Conveyor Power Units," by C. E. Broome, Gears & Forgings, Inc.; and "Possibilities and Limitations of Conveyor Chain Curvature," by J. B. Webb, J. B. Webb Co.

"Power Transmission Engineering as Affecting Production and Cost," a paper by W. W. Nichols, D. P. Brown Co., will be presented at the afternoon meeting, Nov. 23. There will also be prepared discussion relating to chain and other types of drive and savings obtained by proper belting. At the final session of the meeting, Paul Geyser, General Motors Truck Co., will speak on the "Development of Production Engineers and Executives."

Subcommittee reports on process and equipment, production expense, time study, production standards, inspection methods, materials handling and production meetings will be presented at the various technical sessions.

## Coming Meetings

### November

**American Management Association.** Nov. 12 to 16. Fall meeting, Palmer House, Chicago. W. J. Donald, 20 Vesey Street, New York, managing director.

**American Institute of Steel Construction.** Nov. 13 to 17. Sixth annual meeting, Biloxi, Miss. Charles F. Abbott, 285 Madison Avenue, New York, executive secretary.

**American Society of Mechanical Engineers.** Nov. 14 and 15. Iron and steel division, Chicago. Thomas Wilson, 7 South Dearborn Street, Chicago, chairman local section.

**International Acetylene Association.** Nov. 14 to 16. Annual meeting, Congress Hotel, Chicago. A. Cressy Morrison, 30 East Forty-second Street, New York, secretary.

**Open-Hearth Committee, American Institute of Mining and Metallurgical Engineers.** Nov. 15 and 16. Pittsburgh.

**Second International Conference on Bituminous Coal.** Nov. 19 to 24. Carnegie Institute of Technology, Pittsburgh.

**Society of Automotive Engineers.** Nov. 22 and 23. Production meeting. Book Cadillac Hotel, Detroit. C. F. Clarkson, 29 West Thirty-ninth Street, New York, general manager.

### December

**American Society of Mechanical Engineers.** Week of Dec. 3. Annual meeting, 29 West Thirty-ninth Street, New York. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

**National Exposition of Power and Mechanical Engineering.** Week of Dec. 3. Seventh annual meeting, Grand Central Palace, New York. Charles F. Roth, Grand Central Palace, New York, manager.



# German Steel Lockout Affects Market

Nearly Quarter-Million Men Out of Work—British Markets Dull—French Advance Prices—Russian Output Gains

(By Cablegram)

LONDON, ENGLAND, Nov. 5.

CLEVELAND pig iron markets are quiet, but as the present limited output is going directly to local steel works, any increase in demand probably would necessitate restarting additional furnaces. Export inquiry is improving and some small sales have been made to Italy and Norway. Hematite is active and stocks are low, but demand as yet is insufficient to raise prices. Foreign ore is quiet.

Finished steel markets generally are dull, especially as regards heavy material for shipbuilding. Clyde output in October represented 13 vessels launched, aggregating 70,000 tons gross register. New orders are in poor volume, hence the winter outlook is unfavorable.

The South Durham Steel & Iron Co., Ltd., Stockton-on-Tees, is amalgamating with the Cargo Fleet Iron Co., Ltd., Middlesbrough, by exchange of shares. The arrangement contemplates purchase of the Cargo Fleet company by the South Durham company, which will increase its capital obligations by issuing 600,000 new £1 shares, for the purpose. The combined assets of the two companies are about £5,000,000.

Tin plate is quiet and some makers are starting to work off immediately the restriction period agreed upon some time ago, shutting down their works for some weeks. Consumers

are buying only limited quantities, but it is believed that a revival of interest may develop, if the strength of the tin market is maintained.

Galvanized sheets are inactive, but prices are firm, on well filled order books. Black sheets, in general, are quiet.

## On the Continent of Europe

Continental markets are under the influence of the German labor crisis. Already more than 210,000 men in northwestern Germany are locked out.

In consequence, business generally is suspended and prices are advancing.

French production in September was 821,000 (metric) tons of pig iron and 759,000 tons of steel (ingots and castings). Belgian output was 325,000 tons of pig iron and 322,000 tons of steel. Fifty-six Belgian blast furnaces were active on Sept. 30. Luxembourg output in September was 231,000 tons of pig iron and 209,000 tons of steel. Saar output was 158,000 tons of pig iron and 162,000 tons of steel.

## French Advance Semi-Finished Steels

Prices of Billets and Blooms Adjusted to Higher Level of Finished Products—Export Pig Iron Higher

PARIS, FRANCE, Oct. 22.—Domestic business continues quite active and, with the shortage of skilled workmen still acute, the introduction of some foreign labor is contemplated. French metallurgical coke has been advanced 5 fr. (20c.) per ton to 135 fr. (\$5.27), and prices of semi-finished material have been raised 25 fr. (98c.) per ton. The increased cost of raw materials to rolling mills is viewed with some pessimism by certain producers, which believe that too rapid an advance may prevent the revival expected in the business of mills that buy their supplies in the open market.

Pig Iron.—Domestic consumption of phosphoric foundry iron has been

smaller in October than had been expected, so that at the recent meeting of producers it was decided to forego the proposed increase in price of 10 fr. (40c.) per ton, which was to be charged on an additional 6000 tons made available for October delivery. The increase has been applied, however, to iron for delivery in November and December, for which months 38,000 tons each has been set aside for domestic consumers. At the latest meeting of hematite iron makers it was agreed that the price should be increased on all grades by 10 fr. (40c.) per ton, effective Oct. 18. The new quotations are 575 fr. (\$22.43) per ton, f.o.b. Lille, for foundry grade

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works with American equivalent figured at \$4.86 per £ as follows:

Durham coke, del'd.....	£0 17½s.	\$4.31
Bilbao Rubio ore.....	1 2 to £1 2½s.	5.35 to \$5.48
Cleveland No. 1 foundry.	3 8½ to 3 9½	16.64 to 16.89
Cleveland No. 3 foundry.	3 6	16.04
Cleveland No. 4 foundry.	3 5	15.80
Cleveland No. 4 forge...	3 4½	15.68
Cleveland basic (nom.)...	3 5	15.80
East Coast mixed.....	3 10	17.01
East Coast hematite.....	3 10½	17.13
Rails, 60 lb. and up.....	7 15 to 8 5	37.66 to 40.10
Billets .....	6 5 to 6 10	30.37 to 31.59
Ferromanganese .....	13 15	66.83
Ferromanganese (export) 14 0		68.04
Sheet and tin plate bars, Welsh .....	6 0	29.16
Tin plate, base box.....	0 18 to 0 18½	4.37 to 4.40
Black sheets, Japanese specifications .....	13 7½	65.00
Ship plates .....	7 12½ to 8 2½	1.63 to 1.74
Boiler plates .....	9 0 to 10 10	1.92 to 2.25
Tees .....	8 2½ to 8 12½	1.74 to 1.84
Channels .....	7 7½ to 7 17½	1.58 to 1.69
Beams .....	7 2½ to 7 12½	1.53 to 1.63
Round bars, ¾ to 3 in.	7 10 to 8 0	1.62 to 1.69
Steel hoops .....	9 0 to 10 0	1.92 to 2.14
Black sheets, 24 gage...	10 0	2.14
Galv. sheets, 24 gage...	13 10 to 13 15	2.93 to 2.98
Cold rolled steel strip, 20 gage, nom. ....	16 0	3.42

\*Ex-ship, Tees, nominal.

## Continental Prices All F.O.B. Channel Ports (Per Metric Ton)

Foundry pig iron (a):				
Belgium .....	£3 3s.	to £3 5s.	\$15.31	to \$15.80
France .....	3 3	to 3 5	15.31	to 15.80
Luxemburg .....	3 3	to 3 5	15.31	to 15.80
Basic pig iron (a):				
Belgium .....	3 3		15.31	
France .....	3 3		15.31	
Luxemburg .....	3 3		15.31	
Coke .....	0 18		4.37	
Billets:				
Belgium .....	5 0		24.30	
France .....	5 0		24.30	
Merchant bars:				C. per Lb.
Belgium .....	6 5		1.38	
France .....	6 5		1.38	
Luxemburg .....	6 5		1.38	
Joists (beams):				
Belgium .....	5 5		1.16	
France .....	5 5		1.16	
Luxemburg .....	5 5		1.16	
Angles:				
Belgium .....	6 0		1.30	
½-in. plate:				
Belgium (a) .....	6 14		1.48	
Germany (a) .....	6 14		1.48	
¾-in. ship plate:				
Belgium .....	6 9		1.42	
Luxemburg .....	6 9		1.42	
Sheets, heavy:				
Belgium .....	6 1		1.33	
Germany .....	6 1		1.33	

(a) Nominal.

and 530 fr. (\$20.67) per ton, f.o.b. Lille, for forge. The Bordeaux prices of these grades are 610 fr. (\$23.79) for foundry and 590 fr. (\$23) for forge. The entente of French, Belgian and Luxemburg producers, at its recent meeting, agreed to advance export prices on phosphoric foundry iron as follows: F.o.b. Basle, Switzerland, ex-duty, advanced from £3 19s. 3d. (\$19.26) per ton to £4 2s. (\$19.93) per ton; f.o.b. Thionville, for Italy, advanced from £3 0s. 6d. (\$14.70) to £3 2s. 6d. (\$15.18); f.o.b. Antwerp, for all overseas shipment, advanced from £3 5s. 6d. (\$15.92) per ton to £3 8s. (\$16.82) per ton. The price f.o.b. Antwerp for Great Britain is unchanged at £3 5s. 6d. (\$15.92), and the price f.o.b. Dutch frontier is unchanged at £3 7s. (\$16.04) per ton. The entente was renewed for another year.

**Semi-Finished Material.**—To adjust bloom and billet prices in the domestic market to the higher levels of finished products, an increase of 25 fr. (98c.)

per ton has been made, the first since May 15. The new prices are 560 fr. (\$21.84) per ton for blooms and 590 fr. (\$23) per ton for billets. Sheet bars are unchanged at 600 fr. (\$23.40) per ton. Demand for open-hearth material is heavy despite recent advances in prices of from 120 to 180 fr. (\$4.68 to \$7.02) per ton by most mills. One producer in the northeast is asking an advance of only 100 fr. (\$3.90) per ton on open-hearth grade.

**Finished Material.**—The sheet market continues quiet and prices are unchanged. Mills, however, are well booked with tonnage, and delays in delivery on medium-gage sheets range from three weeks to three months. Plate prices vary from 780 to 800 fr. per ton (1.38c. to 1.41c. per lb.), depending upon the location of the mill. There is an active demand for hoops, but the capacity is large and deliveries are good. The base price for hoops is 800 fr. per ton (1.41c. per lb.), but some mills are granting rebates for desirable business.

sales has increased from 32 per cent to 50 per cent of all sales, and as export business is at considerably lower than domestic prices, the mills have actually lost money, it is said.

These figures are in dispute. Should the decision of the arbitration court be rejected by either party, the Ministry of Industry has authority under a law of 1923 to declare the decision in force, thereby precluding a strike or a lockout.

## German Lockout Affects Four-fifths of the Industry

(By Radiogram)

BERLIN, GERMANY, Nov. 5.

**L**OCKOUT of iron and steel employees, which began Nov. 1, continues, with 220,000 workers locked out. Works producing 80 per cent of all the German iron and steel output are closed down. The Steelworks Syndicate has refused to book any more domestic or foreign orders.

Stocks in producers' and traders' hands are sufficient to meet domestic demand for a short time, but increased imports are expected from the Saar district and from France. Until the conflict has been terminated Germany must withdraw entirely from the international market, as a result of which western European prices for iron and steel products are reported to be rising.

## Exports to Far East Still Small

**N**EW YORK, Nov. 5.—Export trade in steel products is still limited to orders for small lots and specialties. Chinese merchants are inquiring for small tonnages of plate cuttings and second-hand material, but the recent advance in the scrap market here has resulted in higher prices than they are willing to pay. Recently Chinese buyers have been inquiring for wire shorts and, finding this material difficult to obtain because of lack of interest among mills and exporters, have advanced their offering prices to \$50 per ton, c.i.f. Chinese port. Much of this lack of interest by sellers is said to be the result of continued claims made by the Chinese buyers on shipments of wire shorts and the low prices offered in China.

Japanese buying is being done largely from British and Continental mills. Welsh tin plate mills are reported seeking tonnage for the rest of this year, although they are well filled with orders for delivery in the first quarter of 1929. Recent quotations on tin plate by American mills have ranged from \$5.15 to \$5.20 per base box, c.i.f. Japanese port. Sheet prices are unchanged at \$76 per ton, c.i.f. Japan, which is too high to permit business, as the Japanese domestic market set by the quotations of the Kawasaki Dockyard Co., Kobe, the leading domestic maker, is \$72.50 per ton.

## Russia Near Pre-War Steel Output

### Pig Iron Production Still Lags—Steel Shortage Foreseen With Large Machinery Building Program

**MOSCOW, RUSSIA, Oct. 20.**—Production of iron and steel in the Government business year, which ended Sept. 30, was close to the pre-war output in steel and rolled products, but considerably smaller than the production of 1913 in pig iron. Output of pig iron for the year 1927-1928 was 3,282,000 metric tons, compared with 4,207,000 metric tons in 1913. Production represented 96 per cent of the program for the business year just closed. Steel ingot production exceeded the year's program by 4 per cent, reaching 4,143,000 metric tons, compared with a pre-war output of 4,247,000 tons. Production of rolling mill products was 3,286,000 metric tons, compared with 3,509,000 tons in 1913.

The program for pig iron output in the year 1928-1929 calls for 3,884,000 metric tons, which is 602,000 tons more than this year's production and 323,000 tons less than the pre-war output. Serious shortage of iron, steel and rolled products is predicted in official circles for the new year. While the production program of iron and steel has been increased by about 12 per cent, the output of general machinery is to be increased 24 per cent, agricultural machinery 28 per cent, and shipbuilding 33 per cent. It is expected that the Government railroads will receive only 87 per cent of their requirements. There is a decided shortage in supplies of bar iron, structural material and sheets for roofing.

To remedy this scarcity of iron and steel, the Council of Economy has called for a census of all available iron and steel scrap in the country, and the holders of this material are to be required to make sales to the Ore and Metal Board. It is expected that

about 900,000 tons of scrap will have been delivered to the board by October, 1929.

Of 1,979,000,000 rubles to be invested by the Government in industrial construction and extensions to existing plants, the heavy iron and steel industry is to receive 248,000,000 rubles, compared with 201,000,000 rubles in the past year. The Council of Economy has ordered more rapid construction of the Telbesse Smelting Works in Siberia, which will cost, together with another large plant at Magnitogorsk, about 300,000,000 rubles. The Telbesse works is in a coal region, and local ore will be sufficient for 20 years on the basis of an annual pig iron output of 640,000 tons. Official consideration is being given to the establishment of a bridge building corporation to be known as the Mostostroi.

## German Wage Dispute Is Before Arbitration Court

**BERLIN, GERMANY, Oct. 23.**—The wage dispute in the Rhenish-Westphalian steel industry has been brought before an arbitration court. Meanwhile the employees continue to demand a wage increase of 15 pf. an hour, and the mills claim that the average profit from sales has not increased this year, so that no wage advance is justified.

According to the syndicate controlling semi-finished material, railroad and structural steel and reports of the Bar Iron Syndicate, the average return has been 3.17 per cent lower than in October, 1927. Although prices have been advanced, the proportion of direct and indirect export



# This Issue in Brief

Business peak will be reached in 1929, forecaster declares. After reaching the peak, business will decline until some time in 1930, depending on how long commercial money rates continue their present upward general trend, Simonds forecasting line indicates.—Page 1153.

\* \* \*

Correct heat treatment of rust-resisting steels is very important, says Dr. Hatfield. Incorrect heat treatment may destroy homogeneity, with consequent setting up of electrolytic corrosion.—Page 1165.

\* \* \*

Proportion of arc welds and acetylene welds has decreased during past 14 years in automobile welded body construction, while spot and flash welds have increased. Reduction in arc welds is due to change in methods.—Page 1154.

\* \* \*

Doubles turnover of plating department by mechanical handling. All material to be plated in cash register plant is conveyed to a central overhead receiving station in charge of one man, who routes it by gravity conveyors to various stations. The same central overhead station receives plated parts and routes them by conveyors to departments performing the next operations.—Page 1152.

\* \* \*

For localized carbonizing and hardening, the most convenient and least expensive method is to copper-plate parts in bulk. Then parts are machined at the places where they are to be hardened. The copper-plating protects the surfaces which are not to be hardened.—Page 1153.

\* \* \*

Aircraft builders will use one million dollars' worth of steel in 1929, according to estimate. Though estimated quantity (4650 tons) is not large, its value is relatively high, as alloy steel is used almost exclusively.—Page 1161.

Do not depend entirely on laboratory tests when using rust-resisting steels, warns British metallurgist. Make frequent shop tests, because in manufacturing processes it is rare that pure substances are used, and small amounts of impurities may make a big difference in corrosion resistance.—Page 1165.

\* \* \*

Barrel-plating superior to still tank-plating, for copper-plating parts to be carbonized and hardened at certain points, cash register manufacturer finds. Attributes this to the dense, compact plate obtained by the burnishing effect of the parts rolling over each other in the barrel.—Page 1153.

\* \* \*

Portable spot welder cuts cost of welding difficult assemblies. Where it was formerly necessary to jig the sub-units with many loose toggle clamps, portable spot welders are now used to fasten the parts into one rigid assembly and the piece is removed for final welding.—Page 1155.

\* \* \*

Speeds up production of special bolts by mounting three dies on header of drop-in die-forging machine. Thus three operations can be done in one heat. Dies are mounted one above the other. Grooves in side of frame in front of header are opposite the dies. Operator pushes heated bar against the header and, as the header goes back for second stroke, he drops his rod to second position and thence to third.—Page 1157.

\* \* \*

Cadmium-plating in cash register plant is wholly automatic. Parts are loaded on metal racks covered with rubber, and carried by plating conveyor through nine operations, returning to the loading station.—Page 1152.

Corrosion resistance of ordinary commercial steel can be much increased, says Dr. Hatfield, by making it free from oxides and gas holes. He suggests that rust is a protective film, and that progressive oxidation may result from puncturing and local destruction of the film through various causes, such as the presence of foreign matter, leading to local electrolytic effects.—Page 1165.

\* \* \*

Spot welding accomplished without surface markings. In automobile body plant, lower welding die is insulated and carries away no current. The current flows out through terminal clamped to inner frame of automobile door.—Page 1155.

\* \* \*

Strength at elevated temperatures, without impaired resistance to scaling, is found in nickel-chromium steels to which tungsten or silicon has been added, says Dr. Hatfield. Ordinary steels lose a substantial proportion of their strength when they attain temperatures in excess of black heat.—Page 1165.

\* \* \*

October daily pig iron production averaged 6.6 per cent. over September. Output of 108,832 tons a day during October was highest daily rate since May, 1927.—Page 1182.

\* \* \*

Solves problem of diverting blooms promptly to any of four destinations, without obstructing production stream. Chain transfer table in new Timken tube mill is located at right angles to shear runout table, so that all blooms can be handled, regardless of their ultimate destination. One operator controls not only the transfer table, but also the two runout tables connected with it.—Page 1166.

A. I. FINDLEY  
Editor

# THE IRON AGE

W. W. MACON  
Managing Editor

ESTABLISHED 1855

## A Stock Market Appraisal

ON other occasions this year we have referred optimistically to the boiling stock market and have rejected bearish prophecy, discerning much that was explanatory of the general rise. We must admit, however, that as things keep on we find much that is increasingly difficult to understand, and not a few other observers are now expressing themselves to the same effect.

The last two years have seen an immense writing up of the market value of the aggregate of corporate stocks listed on the New York Stock Exchange, and the same is true of the listings on all other exchanges. Meanwhile neither earnings nor dividend distributions of these corporations have increased commensurately. Broadly, this indicates that investors have become satisfied with a smaller return. After all, if the transportation industry, the steel industry and other great industries yield only 5 per cent on the investments in them, why should any one be allowed to do more? If indeed any one is doing better there will be a rush to participate in it and it, too, will be brought down to the economic level.

Look down the list of the securities of the New York Stock Exchange, however, and it will be rare that anything sound yields as much as 6 per cent, and it is uncommon to find 5 per cent. On the contrary, most figurings will come to 4 per cent, 3 per cent, 2 per cent or nothing at all. This obviously implies the belief that earnings are already in excess of dividends or that they are going to be; in other words, that sooner or later dividends will be increased to a rate of 5 or 6 per cent. This naturally raises the question whether earnings are always what they are supposed to be.

There are some industries in which well managed companies are doing new things wherein the estimates and expectations are well founded, without any doubt. On the other hand are some industries wherein the forecasting and discounting are severely straining the imagination. Investors in them may come out all right eventually; but they may have to wait a long time, and at the end of 10 years they may figure that they would have done better had they lent their money at 5 per cent. Speculative pools, taking advantage of the popular psychology of the day, have boosted some stocks far beyond their value upon any basis of reckoning, even with the exercise of the imagination of a Colonel Sellers.

Plainly, the speculative buyers of a good many stocks, as was the case with buyers of Florida lots, are going to see their high-priced acquisitions shrink, for there is a top for everything. The time is bound to come when there are more sellers than buyers and

many will learn that they have overstayed their market; for the pools that are voluble in their recommendations to purchase are going to be silent in respect to any advice about selling. Our own advice to everybody in this juncture is not to gamble, neither for bull account nor for bear. The speculative investor who buys on the basis of a 5 to 6 per cent dividend yield, already in realization or in early prospect, convinced by good knowledge of industrial conditions and special corporate affairs, is warranted in doing so, but not even such a one should be a borrower of money for the purpose.

## Progress in Steel Merchandising

WHEN the calendar year's financial results in steel manufacture come to be counted up a fair amount of progress will be shown in the direction of getting prices commensurate with production costs. It is just a year now since a fresh spirit spread over the steel producing trade in this matter and it is a fitting time to cast up the results.

Shipments of bars, shapes, plates and wire are at substantially better prices than one year ago. Sheets and strips on the whole are not. One might think that this is a chance alinement, but perhaps it is not. The products in the first group are all old and well established. There is only occasional chance for any cost reduction, even a small one. Sheet production is not nearly so old and strips are quite a new commodity. Producers of both seem to have reduced their costs by no negligible amount in a year's time. However, some of the bare returns may be misleading, since there has been a large increase in production, and mills in both lines feel amply justified in seeking higher prices for the first quarter of the new year.

Though it appears from the bare figures of prices that not a great deal has been accomplished this year, it must be considered that for about four years the general trend of steel prices had been downward. Of course it was absolutely essential to arrest that decline, but just the same it was a definite achievement to do so.

On account of a large increase in tonnage there were much better earnings in the first quarter of this year than in the last quarter of the old year and not much significance, as to realized prices, attached to the returns. From the first to the second quarter there was practically no change in the tonnage of steel shipped from mills, and there was a substantial increase in total earnings. That was to be ascribed almost wholly to higher realized prices. These third quarter reports do not show a corresponding increase in earnings. One large independent showed a decrease from second quarter. Another showed a very small gain compared



with that of its second quarter. The need of still more careful merchandising is indicated.

The steel industry has accomplished more than it fully realizes in the direction of holding its prices to a relation with total cost, for with the great increase in mechanization the overhead is a much larger proportion of total cost than formerly. There was a time when the bare out-of-pocket cost was the chief consideration. That conception has been formally abandoned but it would bob up if given a chance, and it is the duty of the seller to keep it entirely out of the conscious or unconscious mind.

### The Germ of Future Prosperity

EVERYONE knows the intimate connection between advertising and present-day journalism. The relationship between advertising revenue and the success of a publication is so close that some people find it difficult to realize that the editor's first duty is toward his reading patrons, his "circulation." This fact does not prevent the editor as a publicist from appreciating clearly the value of consistent advertising. Quite the opposite, for of course what the advertiser buys from the publisher is an opportunity to tell his story to a carefully selected audience. That audience the editor must maintain. It is therefore no accident that various preachments have appeared in these pages upholding the proposition that publicity pays, even should the whole steel industry engage in it.

In this connection a very definite problem must be met by a small unit of such an industry, making, let us say, a group of special steels, making them well, and getting a fair proportion of the business. No great amount of money is available for sales promotion. A part is to be used for publicity and advertising—a little, certainly not enough to run a campaign in a popular weekly of general circulation; not much more than enough to get good space in one or two of the trade journals. How best to disburse this modest appropriation is indeed a problem.

Strong arguments will be advanced by the proponents of "direct mail" advertising that here is a clear job for them. The advertiser's output is specialized; the market is limited and fairly well known. "Put your own story to your own customers personally through the mails; do not get lost among a hundred other advertising pages," they may advise. But the fly in the ointment is this: Many other direct-by-mail advertisers are also competing for the attention of the prospective purchaser; so much material comes to each business man or householder that only a fraction of it is read, even opened, before it goes to the waste basket.

Consideration of the mass of direct-by-mail advertising and numerous "house organs" indicates that at least four elements are necessary for success; and the combination is so difficult that it is no wonder there are dozens of failures for every successful effort:

1. Adequate resources of information and illustration.
2. Consistent editorial direction.
3. Outstanding quality in the printed matter.
4. An excellent mailing list.

Even though men and materials for the first three may be available (and they are not cheap), lack of the last essential will be their undoing.

Of course, a mailing list can start with the present

and past customers of the firm. But if the ledger is the sole source of names, the advertiser is hedged in a small and diminishing area. Old customers drift away, consolidate, go out of business. Where can they be replaced?

Here, it seems, is the first aid the technical press can give to even the closest adherent of direct-by-mail advertising. How else but by advertising in the trade press can such a manufacturer of basic supplies or equipment as we are visualizing get his story so cheaply or so effectively before the new men who are continually entering the field? How better can he impress these newcomers with the progressiveness, the responsibility and the reliability of his firm than by consistent and attractive advertising? Originally, as prospective customers, their purchasing power is doubtless small; nevertheless the little fellows of today are the big boys of tomorrow. If a vendor can establish cordial relations with a small business, he has the inside track to the real sales later on. Even though a specialty of specialties is being handled, and interest maintained adequately by direct mail, the trade press is and always will be necessary to reach the great outside unknown market which holds the germ of future prosperity.

### Making Competition Fair

WHEN the Sherman law was passed it was the common idea that the head and front of possible offending by business was such restraint of trade as resulted in extortionate prices. Latterly much more emphasis is put on forms of unfair competition that demoralize relations between competitors and thus cripple industry and trade. No tendency is so marked in business today as the giving way of individualism to group action. The cooperative spirit is taking hold of business men and is making them willing to subordinate individual advantage to the interest of the group. As it is put by Charles F. Abbott elsewhere in this issue, he who resorts to unfair competitive methods "scuttles the ship in which he himself is afloat."

The latter-day movement to regulate competition does not aim to fix prices but rather to get rid of unethical practices. Some of these latter are listed by Mr. Abbott. It is felt that, when the views of a given industrial group on practices that should be banned are crystallized in a code, competition can be lifted to a higher plane. Professional ethics have long been a powerful influence in medicine, though obviously unenforceable by law.

Competitive attacks are commonly defended on the ground of retaliation. Yet reprisals are often based on nothing more than distrust. Cooperation in adopting a selling code, it is argued, would do much to promote mutual confidence and dispel suspicion.

The Federal Trade Commission has cooperated with various industries in formulating codes of practice and has branded violations as "unfair methods of competition," presumably punishable by law. That the Trade Commission can do much in encouraging the adoption of codes is conceded, but it is an open question—still undecided by the courts—whether enforcement by law is possible or advisable. Unfair competition can manifest itself in such devious ways as to make its ferreting out in all the labyrinths of modern trade a stupendous

task. The most effective remedy lies in cultivating a spirit of self-respect and of loyalty in industrial and commercial groups rather than inviting further invasion of business by the Government.

### Studying for Leisure

BOUT a fortnight ago two thousand admirers gathered to do honor to nine "Pioneers of American Industry." While some of the nine might be more properly thought of as organizers and executives than as "pioneers," no one would begrudge the wealth and honors heaped upon them for great achievements. This is the roll:

Cyrus H. K. Curtis, publishing.  
Glenn H. Curtiss, aircraft.  
George Eastman, photography.  
Thomas A. Edison, invention.  
Harvey S. Firestone, rubber.

Henry Ford, automobiles.  
Julius Rosenwald, merchandising.  
Charles M. Schwab, iron and steel.  
Orville Wright, aviation.

One point is worth mentioning: Not a single one of them had a university education. Mr. Schwab wittily referred to this fact and sounded a warning. "Many graduates come from college with an education that exceeds their intelligence," he said.

Dr. Nicholas M. Butler, president of Columbia University, rejoined with the remark that such men as the honor guests were giving the human race so many mechanical aids that the problem of the near future would be to teach men and women how to use their leisure time to best advantage, rather than to prepare them for an "occupation." In other words, the swing of the pendulum brings us back to the earlier ideal of going to college to become a cultured citizen, rather than to learn a profession.



## Selling Code Is Prime Need

Industries Must Set Up Standards to Check Unfair Competition—Remedy for Short-Sighted Selling Lies in Cooperation, Not Laws

BY CHARLES F. ABBOTT\*

"The individual who refuses to cooperate with his competitors scuttles the ship in which he himself is afloat."—Charles F. Abbott.

**W**E are now face to face with the problem of distribution, of scientific marketing and selling. Most men will agree that, even with business activity at a high pitch, prices have been unsatisfactory, profits have been disappointing and competition has been more difficult to meet.

Short-sighted selfishness is the root of most selling troubles. Until it gives way to a spirit of justice and fairness and a sense of duty to one's industry, we cannot expect real relief. It is only through sincere cooperation and fair play that a way can be found to dissipate unenlightened competitive practices.

No cure for this malady can be obtained through any legal process; the only hope rests in spreading the spirit of fair dealing and industry-consciousness. To this end the best available plan is the setting up of ethical standards and then striving for their general adoption.

Moses gave the world the Ten Commandments, the first of all ethical codes. Murders are still being committed, but crime has been sharply reduced throughout civilized countries and most of the people everywhere are at least trying to live up to the code of living set forth in the decalogue.

#### Only Unskilled Amateurs Break the Rules to Win

In business many of our unfair practices are blamed on the buyer. But we must not forget that most of the unfair tactics used by the buyer were taught him by the over-anxious seller, who is now being confounded by tricks of his own creation.

Who can deny that it is unfair for a seller to submit a second and lower price when the order rightfully belongs

to a competitor? Or that it is improper for a manufacturer to solicit business from jobbers and then go directly to the jobbers' customers with prices as low or lower than those established for the jobbing trade?

The acceptance of a standard selling code is essential. Eventually this need will be recognized. Little men think themselves wise when they take an hour to figure out how they can beat out a competitor. Big men are continuously searching for ideas that will build up their business. Herbert Casson once stated that in business as in golf it is only the unskilled amateurs who have to break the rules to win; and in both golf and business they are soon found out.

#### Making Each Sale Stand on Its Own Bottom

In the past sales executives have devoted too much attention to volume instead of profits. Hard pressed to obtain business and keep it away from competitors, they have been driven into a state of volume-mindedness. Today, this attitude is being changed by the campaign to increase net profits now being pushed by far-sighted commercial executives.

Sales totals are being "broken down" to determine selling costs. By finding the percentage of selling expenses to the sales of each sales representative attention is being focused on the net profit from each sale. Sales organizations are becoming "profit conscious," and this calls for a radical change in personnel and policies. The day of the volume seeker is passing.

#### Production Must Be in Keeping with Demand

Industry must understand and accept the theory of stabilized production. It must recognize the folly of attempting 100 per cent output with a 50 per cent demand. It must recognize the spirit of live and let live and avoid prac-

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tices that invite reprisals and lead to price demoralization. It must add a profit to total cost in fixing selling prices. It must learn that a million times nothing is still nothing. Failure to adhere to a one-price policy invites price wars. The one-price policy is a basic fundamental of sound salesmanship. Without it, a selling program is at the mercy of the buyers.

Fair dealing calls for a price structure that is in keeping with a reasonable profit. If concessions are to be made, they should be based on cost reduction instead of cutting into the margin of profit.

#### Refusal to Cooperate Injures Entire Industry

The obvious advantages of doing business on a stable and equitable price basis accounts for the growing interest in a standard selling code. Such a code is still regarded as visionary by some, but certainly nothing is to be lost in cultivating the sense of fair play innate in every man and encouraging habits of cooperation. Few factors do more to retard the natural progress of a business or a movement than the lack of intelligent cooperation.

The individual who refuses to cooperate with his competitors, and who insists upon ruthless price cutting as a means of obtaining business, is worse than a criminal. He is a fool. He not only pulls down the standing of his company; he not only pulls down his competitors; he pulls down himself and his whole trade. He scuttles the ship in which he himself is afloat.

#### Codes of Selling Practice Now in Effect

Practical codes of selling practice have been prepared and adopted by many organizations with splendid results. Among those that have done so are the Better Business Bureau, the International Advertising Association, the National Association of Purchasing Agents, the American Society of Civil Engineers, the American Institute of Architects, the Chamber of Commerce of the United States and the National Association of Credit Men. Industries that are profiting by the use of codes of practice include the Associated General Contractors, the American Face Brick Association, the Electric Power Club, the National Slate Association, the American Electric Railway Association, the National American Wholesale Lumber Association, the Motion Picture Theater Owners of America and the National Retail Hardware Association.

There is a distinction between so-called codes of standard practice and those that deal exclusively with ethics. Some five years ago the American Institute of Steel Construction prepared and adopted a Code of Standard Practice. This code includes rules that control all contractual relations between the buyer and the seller. Written in a positive form, it clearly specifies just what each party may expect. Its use has eliminated the misunderstandings and controversies that previously existed. Many economies have followed its general acceptance and the public has benefited to a large extent.

#### Selling Practices That Are Harmful

Codes of selling practice deal with the ethics involved in sales relations between manufacturers, jobbers, retailers and consumers and between each other within these groups.

The jobbing industry extends an invaluable service to the public in being able to supply small orders promptly. Its overhead expenses and other items, added to the cost of its stock plus a reasonable profit, go to make up its sales prices. Unless the manufacturers are willing to recognize the value of this service, and refrain from quoting prices directly to the customer that fail to include the distributor's charges, then the warehouse industry cannot possibly continue. Its elimination would inflict a handicap upon the public in taking away a service that no producer is equipped to extend.

There are manufacturers who produce raw materials

that are sold to industries for fabrication into various products and resold by them to jobbers, retailers or consumers. If the original producer were to set up a fabricating plant of its own, supply the raw material at production costs and operate the plant as a means of increasing the output of the producing unit without regard to profits in the rehandling, and sell the output directly to jobbers, retailers or consumers at prices lower than the fabricating industry could possibly quote, then such a policy would naturally be held unfair and unethical. Dissatisfaction would follow, and conditions would force the intermediate industry to seek another source of supply.

An unethical practice that should be universally condemned is for a buyer to lead the seller to believe that his prices are high when he is actually the low bidder. It never pays to jeopardize an important source of supply and, unless all transactions can be concluded on a basis of reasonable profit, then substitutions follow with serious impairment in quality and service.

Commercial bribery is another unethical practice which dissipates sound salesmanship and stamps all parties addicted to it as irresponsible and dishonest.

Failure to apply a fixed price policy is an unethical practice. To submit a price as a "practice shot" with five or six lower ones held in reserve is an unfair policy. The buyer suffers from the lack of stabilized prices, while the seller loses if he makes successive price cuts when his first quotation may have been the lowest. A salesman without courage is like a ship without a rudder. He is continually being blown about in different directions by the winds of fear, doubt and uncertainty.

A manufacturer who depends on the jobber as his logical distributor engages in an unethical practice whenever he sells the financially irresponsible or those without equipment or recognition in the industry, and at prices as low or lower than those scheduled for the jobber.

The following subjects could well be covered in a code of selling practice:

1. A one-price policy.
2. Commercial bribery.
3. Attitude toward competitors.
4. Misrepresentation.
5. Secret rebates.
6. Unfairness of selling at or below cost.
7. Preferential allowances.
8. Price discrimination.
9. Arbitration.
10. An agreement to uphold the standards as established by the industry and avoid substitution or impairment of quality or workmanship.

#### How Federal Commission Can Aid in Enforcing Codes

The Federal Trade Commission is now prepared to supervise trade practice conferences whenever its assistance is solicited by a representative majority of the group interested. Forty of these conferences have already taken place and about 30 applications are pending.

The commission holds that a clandestine violation of a trade practice conference rule by one who has openly subscribed to that rule is an unfair method of competition within the meaning of the Federal Trade Act.

Industry is awakening to a realization that its competitive methods must be adjusted upon a basis that will permit fair profits. Failure to do so may invite Government regulation to protect the public, which eventually suffers when business exists on an unprofitable basis. Rancor, hatred and jealousy must give way to just relationships based upon codes of ethical practice.

Business men on the average are growing better. They are becoming more intelligent and better educated. This makes for legitimate advancement and prosperity. The secret of better business is to climb up from retaliation to reciprocity. Codes of selling practice will speed up that evolution.

# October Iron Output Very Large

Daily Rate Gained 6755 Tons or 6.6 Per Cent Over September—

Largest October Since 1918—No Gain or Loss in Furnaces

**A**CTUAL data covering pig iron production for October correspond quite closely with the estimates published in THE IRON AGE, Nov. 1, and collected by wire on Oct. 30. The October daily rate was 108,832 gross tons per day; the estimated figure as published was 108,800 tons.

Total October coke pig iron output was 3,373,806 tons or 108,832 tons per day for the 31 days as against 3,062,314 tons or 102,077 tons per day for the 30 days in September. This is an increase for October of 6755 tons per day or 6.6 per cent. In September the increase was 0.88 per cent with the August increase 2.1 per cent. The October daily rate last year was 89,810 tons. The daily rate

last month was the largest in 17 months or since May, 1927, when it was 109,385 tons per day. The October rate this year is also the largest for that month since 1918; in fact there have been but two October daily rates exceeding that of this year—in 1918 and in 1916.

## Operating Rate Active on Nov. 1

On Nov. 1 there were 197 furnaces active, having an estimated operating rate of 108,800 tons per day. This compares with 106,755 tons per day as the operating rate for the 197 furnaces active on Oct. 1, eleven furnaces having been blown in and 11 shut down during October. The higher operating rate for the same

number of furnaces is explained by the greater effort to increase output, usual in October.

Of the 11 furnaces blown in during October five were Steel Corporation stacks and six belonged to independent steel companies. There were four Steel Corporation furnaces and four independent steel company stacks shut down besides three merchant furnaces. Thus there was a net gain of three steel-making furnaces and a net loss of three merchant furnaces.

## Steel and Merchant Iron

Steel-making iron last month was made at the rate of 88,051 tons per day, a gain of 5461 tons over the

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1924—Gross Tons

	1924	1925	1926	1927	1928
Jan. ....	97,384	108,720	106,974	100,123	92,573
Feb. ....	106,026	114,791	104,408	105,024	100,004
Mar. ....	111,809	114,975	111,032	112,366	103,215
Apr. ....	107,781	108,632	115,004	114,074	106,183
May ....	84,358	94,542	112,304	109,385	105,931
June ....	67,541	89,115	107,844	102,988	102,733
½ year ...	95,794	105,039	109,660	107,351	101,763
July ....	57,577	85,936	103,978	95,199	99,091
Aug. ....	60,875	87,241	103,241	95,073	101,180
Sept. ....	68,442	90,873	104,543	92,498	102,077
Oct. ....	79,907	97,528	107,553	89,810	108,832
Nov. ....	83,656	100,767	107,890	88,279	.....
Dec. ....	95,539	104,853	99,712	86,960	.....
Year .....	85,075	99,735	107,043	99,266	.....

Pig Iron Production by Districts, Gross Tons

	October (31 days)	September (30 days)	August (31 days)	July (31 days)
New York and Mass. ....	213,614	183,557	188,399	192,126
Lehigh Valley .....	96,912	78,272	72,648	64,921
Schuylkill Valley .....	53,364	51,116	52,231	53,855
Lower Susq. and Leba- non Valleys .....	31,084	30,680	33,153	30,079
Pittsburgh district .....	741,363	622,023	628,471	586,923
Shenango Valley .....	101,787	86,136	86,691	88,366
Western Pennsylvania ..	146,988	138,021	138,253	120,389
Maryland, Va. and Ky. ..	111,543	113,108	112,555	111,741
Wheeling district .....	141,727	149,813	157,507	154,636
Mahoning Valley .....	347,118	309,512	307,547	287,688
Central and North'n Ohio	332,966	328,382	376,706	379,277
Southern Ohio .....	46,074	45,363	46,367	44,339
Illinois and Indiana .....	655,022	609,891	625,452	636,961
Mich., Minn., Mo., Wis., Colo. and Utah .....	125,979	112,030	113,737	122,875
Alabama .....	222,142	197,367	188,896	189,383
Tennessee .....	6,123	7,043	7,957	8,265
Total .....	3,373,806	3,062,314	3,136,570	3,071,824

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchant Iron*	Total
October, 1927 .....	66,991	22,819	89,810
November .....	64,600	23,679	88,279
December .....	64,118	22,742	86,860
January, 1928 .....	69,520	23,053	92,573
February .....	78,444	21,560	100,004
March .....	83,489	19,726	103,215
April .....	85,183	21,000	106,183
May .....	85,576	20,355	105,931
June .....	81,630	21,103	102,733
July .....	79,513	19,578	99,091
August .....	82,642	18,538	101,180
September .....	82,590	19,487	102,077
October .....	88,051	20,781	108,832

\*Includes pig iron made for the market by steel companies.

Operating Rate of Coke Furnaces in Blast

	Nov. 1		Oct. 1	
	Number in Blast	Gross Tons per Day	Number in Blast	Gross Tons per Day
<b>New York:</b>				
Buffalo .....	12	5,900	11	5,640
Other N. Y. and Mass. ....	2	940	2	880
New Jersey .....	0	.....	0	.....
<b>Pennsylvania:</b>				
Lehigh Valley .....	7	3,120*	6	2,600*
Schuylkill Valley .....	4	1,710	5	2,000
Susquehanna Valley .....	2	920	2	940
Ferromanganese .....	0	.....	0	.....
Lebanon Valley .....	0	.....	0	.....
Ferromanganese .....	1	80	1	80
Pittsburgh District .....	39	24,600	35	22,100
Ferromanganese .....	2	320	2	320
Shenango Valley .....	6	3,270	6	3,300
Western Pennsylvania ..	9	4,340	9	4,400
Ferromanganese .....	1	210	1	180
Maryland .....	5	2,740	5	2,770
Wheeling District .....	7	4,570	8	4,990
<b>Ohio:</b>				
Mahoning Valley .....	18	10,750	18	10,400
Central and Northern .....	18	10,740	18	10,945
Southern .....	3	1,370	4	1,540
Illinois and Indiana .....	29	20,760	30	20,960
Mich., Wis. and Minn. ....	6	2,700	5	2,200
Colo., Mo. and Utah .....	4	1,650	4	1,600
<b>The South:</b>				
Virginia .....	0	.....	1	145
Ferromanganese .....	1	90	0	.....
Kentucky .....	2	760	2	760
Alabama .....	17	7,000	19	7,700
Ferromanganese .....	1	70	1	70
Tennessee .....	1	190	2	235
Total .....	197	108,800	197	106,755

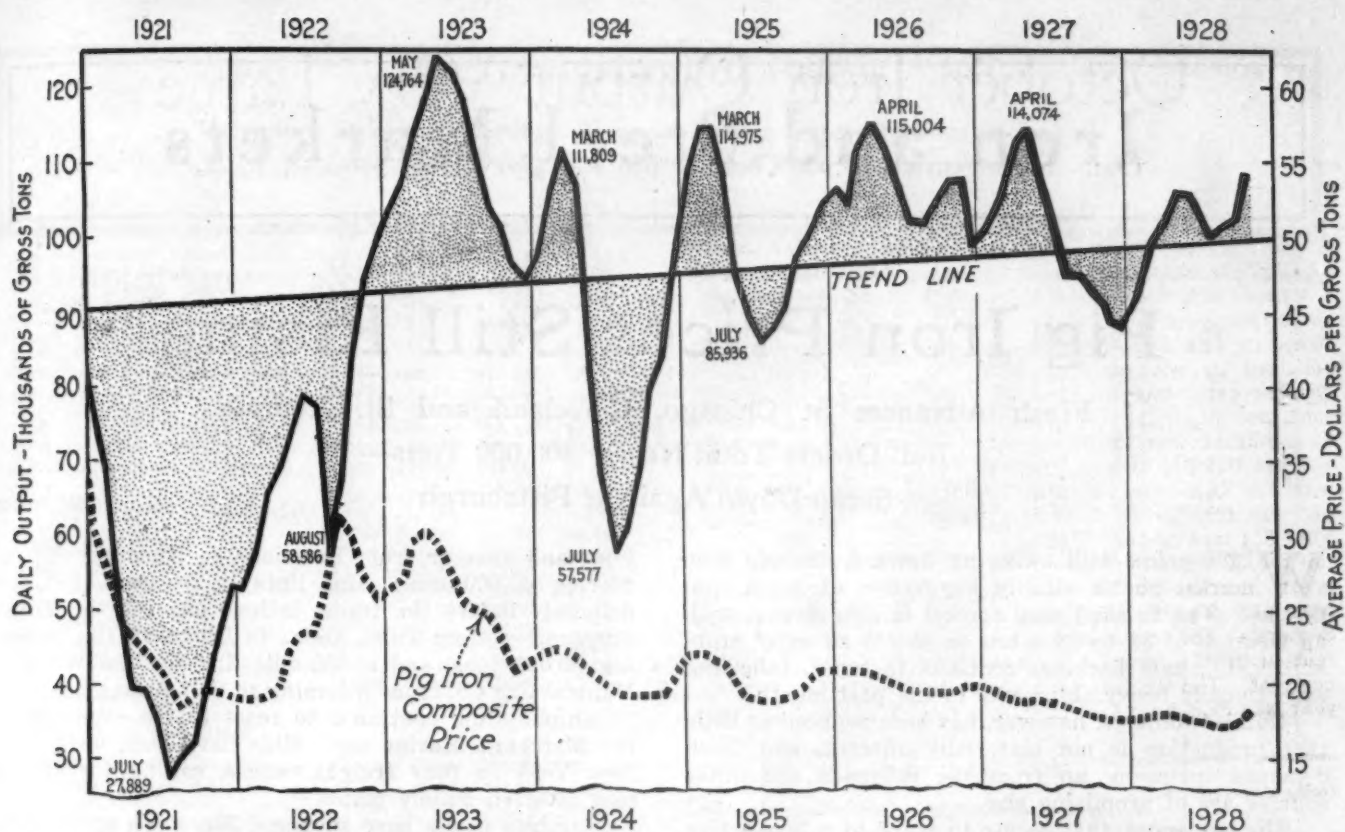
\*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months, Beginning Jan. 1, 1926—Gross Tons

	1926	1927	1928
Jan. ....	3,316,201	3,103,820	2,869,761
Feb. ....	2,923,415	2,940,679	2,900,126
Mar. ....	3,441,986	3,483,362	3,199,674
Apr. ....	3,450,122	3,422,226	3,185,504
May ....	3,481,428	3,390,940	3,283,856
June ....	3,235,309	3,089,651	3,082,000
½ year .....	19,848,461	19,430,678	18,520,921
July .....	3,223,338	2,951,160	3,071,824
Aug. ....	3,200,479	2,947,276	3,136,570
Sept. ....	3,136,293	2,774,949	3,062,314
Oct. ....	3,334,132	2,784,112	3,373,806
Nov. ....	3,236,707	2,648,376	.....
Dec. ....	3,091,060	2,695,755	.....
Year* .....	39,070,470	36,232,306	.....

\*These totals do not include charcoal pig iron. The 1927 production of this iron was 164,569 tons.





Daily Pig Iron Output in October Was 6.6 Per Cent More Than in September; Composite Prices Substantially Unchanged  
Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 415,000 tons

82,590 tons per day in September. The daily rate for merchant iron also increased to 20,781 tons as against 19,487 tons—a gain of 1294 tons per day for October.

#### Furnaces Blown In and Out

During October the following furnaces were blown in: One Lackawanna stack of the Bethlehem Steel Co. in the Buffalo district; one Bethlehem stack of the Bethlehem Steel Co. in the Lehigh Valley; one Swede furnace of the Alan Wood Iron & Steel Co. in the Schuylkill Valley; one Eliza furnace of the Jones & Laughlin Steel Corporation and two Edgar Thomson, one Duquesne and one Carrie furnace of the Carnegie

Steel Co. in the Pittsburgh district; one Cambria stack of the Bethlehem Steel Co. in western Pennsylvania; one South Chicago furnace of the Illinois Steel Co. in the Chicago district, and one furnace of the Ford Motor Co. in Michigan.

The following furnaces were blown out or banked last month: One Swede furnace of the Alan Wood Iron & Steel Co. and the Keystone furnace of the Reading Iron Co. in the Schuylkill Valley; one Clairton stack of the Carnegie Steel Co. in the Pittsburgh district; one Cambria stack of the Bethlehem Steel Co. in western Pennsylvania; the Martins Ferry furnace of the Wheeling Steel Corporation in the Wheeling district; the furnace of

the Jackson Iron & Steel Co. in southern Ohio; one South Chicago stack of the Illinois Steel Co. and one Madeline furnace of the Inland Steel Co. in the Chicago district; one Bessemer and one Ensley furnace of the Tennessee Coal, Iron & Railroad Co. in Alabama, and the Rockdale furnace of the Tennessee Products Corporation in Tennessee.

#### Possibly Active Stacks Reduced

The two Warwick furnaces of the Warwick Iron & Steel Co., Pottstown, Pa., have been sold and will be dismantled. This reduces the number of possibly active stacks in the United States from 339 to 337.

#### Production of Steel Companies for Own Use—Gross Tons

	Total Pig Iron Spiegel and Ferromanganese			Ferromanganese*		
	1926	1927	1928	1926	1927	1928
Jan. ....	2,599,876	2,343,881	2,155,133	29,129	31,844	22,298
Feb. ....	2,272,150	2,256,651	2,274,880	22,309	24,560	19,320
Mar. ....	2,661,092	2,675,417	2,588,158	24,064	27,834	27,912
Apr. ....	2,677,094	2,637,919	2,555,500	24,134	24,735	18,405
May ....	2,687,138	2,619,078	2,652,872	23,159	28,734	29,940
June ....	2,465,583	2,343,409	2,448,905	25,378	29,232	32,088
½ year. ....	15,362,933	14,876,355	14,675,448	148,173	166,939	149,963
July ....	2,461,161	2,163,101	2,464,896	26,877	26,394	32,909
Aug. ....	2,424,687	2,213,815	2,561,904	23,557	21,279	24,583
Sept. ....	2,436,733	2,090,200	2,477,695	25,218	20,675	22,278
Oct. ....	2,578,830	2,076,722	2,729,589	28,473	17,710	23,939
Nov. ....	2,484,620	1,938,043	.....	31,903	17,851	.....
Dec. ....	2,322,180	1,987,652	.....	31,627	20,992	.....
Year .....	30,071,144	27,345,888	.....	315,828	291,840	.....

\*Includes output of merchant furnaces.

#### Slight Reduction in Power Output

Production of electric power by public utility power plants in the United States in September is reported by the Geological Survey at 7270 millions of kw/hr. This is a reduction of more than 3 per cent from the August total of 7505, but is nearly 2 per cent ahead of the July total of 7143. Less of the September power was produced by hydraulic plants, the reported amount being 2785, which is about 38 per cent of total power production. This compares with 3044 in August, about 40½ per cent; and with 3075 in July, about 43 per cent.

# Iron and Steel Markets

## Pig Iron Prices Still Rising

Fresh Advances at Chicago, Cleveland and St. Louis—

Rail Orders Total Nearly 300,000 Tons—

Scrap Down Again at Pittsburgh

WITH prices still swinging upward, the pig iron market shows vitality suggestive of boom conditions. The finished steel market is also strong, with an advance of \$2 to \$3 a ton on sheets an early probability, but mill backlogs continue to taper, following exceptionally heavy shipments in the past month.

Unfilled tonnage, however, has been reduced so little that production is not materially affected, and fresh demands springing up from the railroads and other sources are of promising size.

The one index that seems to point to a less active market situation is scrap. Heavy melting steel at Pittsburgh has declined 25c. a ton for the second time in two weeks, and at Philadelphia it has dropped 50c. a ton.

With the large shipments of finished steel in October, it will be surprising if ingot statistics for that month do not show an output at least equal to the tonnage for March, the previous high month of the year. November steel production points to a gradual recession, activity now ranging from 85 to 90 per cent. The average for Steel Corporation plants has declined to 85 per cent, partly because of the shutting down of the Gary rail mills, bringing the rate of the Chicago subsidiary down to 75 per cent.

That the setback in the Chicago district is only temporary is indicated by sales of the week, which were the highest so far this year and with one exception the largest in three years. Orders for 185,000 tons of rails formed an important part of the total. Rail bookings for the country exceeded 290,000 tons, of which the New York Central accounted for 191,550 tons—70 per cent for immediate specification and the remainder on option. Other orders included 48,000 tons placed by the St. Paul and 5000 tons purchased by the Monon.

Pending railroad equipment business, swelled by a Wabash inquiry for 2000 box cars, now calls for a total of nearly 10,000 cars, requiring 140,000 tons of steel. The Santa Fe is expected to enter the market for 6000 cars and the Illinois Central for 2500.

Demand for steel from the automobile industry has declined from its recent peak, but heavy buying is expected to set in again by Dec. 1. Meanwhile, Ford output has increased to 6000 cars a day, and the Chevrolet company has released steel specifications for 125,000 cars of its new model, on which production will start shortly.

Line pipe business, which has been an important tonnage item this year, promises to make further heavy drafts on the mills. Figures are being taken on a gas line from Louisiana to St. Louis, calling for 115,000

tons, and another from Louisiana to Birmingham, requiring 40,000 tons. Gas lines in prospect, but not definitely before the trade, include one for the Texas Corporation from Tulsa, Okla., to Lockport, Ill., involving 60,000 tons, and a 350-mile line for the Western Natural Gas Co. from Wyoming to Salt Lake City.

Shipbuilding continues to react to the stimulus of the Merchant Marine act. Bids have been opened in New York on four freight vessels, calling for 13,000 tons of steel, mainly plates.

Pig iron prices have advanced 50c. a ton at Chicago for the second time in two weeks, and equal increases have been registered at Cleveland and St. Louis. Prices for foundry and malleable pig iron at Cleveland are now \$2 to \$2.50 a ton higher than in midsummer.

Sales at Cleveland totaled 69,000 tons and at St. Louis, 45,000 tons, in large part for first quarter delivery. At Chicago, pig iron shipments in October were heavier than for any previous month in 1928, and shipments for the year are expected to set a new record.

Despite the pressing demand for pig iron, complete blast furnace returns for October show a loss of three active merchant stacks during the month. This was canceled by a net gain of three steel works furnaces, the total number of active stacks Nov. 1, at 197, being exactly the same as on Oct. 1. The average operating rate, however, increased from 106,755 tons on Oct. 1 to 108,800 tons a day on Nov. 1.

The tin plate price for 1929 will probably be announced between Nov. 15 and Nov. 20. If an advance is made it is not expected to exceed \$2 a ton.

The new base prices on hot-rolled strip, recently announced, do not govern cooperage stock, as was first supposed. The base on this product, as quoted by some makers, is 2.10c. per lb., Pittsburgh, or \$2 a ton above the base on narrow strips.

Cold-rolled strips are now definitely established at 2.85c. a lb., Pittsburgh or Cleveland, or \$2 a ton above the recent minimum price. Consumers covered liberally before the advance.

Several manufacturers of wire nails have adopted a plan under which jobbers will be given a differential of 10c. per 100 lb. under prices charged other classes of carload buyers.

The locking out of 220,000 steel workers in Germany on Nov. 1 has closed plants representing 80 per cent of the iron and steel capacity of that country.

Making the eighth advance in 11 weeks, from a low of \$17.04 in August, THE IRON AGE composite price for pig iron has reached \$18.34 a gross ton, compared with \$18.25 last week. The finished steel composite remains at 2.369c. for a second week.



## A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Nov. 5, 1928	Oct. 30, 1928	Oct. 9, 1928	Nov. 7, 1927
No. 2 foundry, Philadelphia...	\$20.76	\$20.76	\$20.76	\$19.76
No. 2, Valley furnace.....	17.50	17.50	17.00	17.50
No. 2, Southern, Cin'tl.....	19.94	19.94	19.94	19.69
No. 2, Birmingham.....	16.25	16.25	16.25	16.00
No. 2 foundry, Chicago*.....	20.00	19.50	18.50	18.50
Basic, del'd eastern Pa.....	19.75	19.75	19.00	20.00
Basic, Valley furnace.....	17.50	17.50	17.00	17.00
Valley Bessemer, del'd P'gh....	19.76	19.76	19.26	19.76
Malleable, Chicago*.....	20.00	19.50	18.50	18.50
Malleable, Valley.....	18.00	18.00	17.50	17.50
Gray forge, Pittsburgh.....	18.76	18.76	18.26	18.76
L. S. charcoal, Chicago.....	27.04	27.04	27.04	27.04
Ferromanganese, furnace.....	105.00	105.00	105.00	90.00

Rails, Billets, Etc., Per Gross Ton:	Nov. 5, 1928	Oct. 30, 1928	Oct. 9, 1928	Nov. 7, 1927
O.-h. rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh.....	33.00	33.00	33.00	33.00
O.-h. billets, Pittsburgh.....	33.00	33.00	33.00	33.00
O.-h. sheet bars, P'gh.....	33.00	33.00	33.00	34.00
Forging billets, P'gh.....	38.00	38.00	38.00	38.00
O.-h. billets, Phila.....	37.30	37.30	37.30	38.30
Wire rods, Pittsburgh.....	42.00	42.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.....	1.90	1.90	1.90	1.75

### Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia.....	2.12	2.12	2.12	2.07
Iron bars, Chicago.....	2.00	2.00	2.00	1.85
Steel bars, Pittsburgh.....	1.95	1.95	1.90	1.75
Steel bars, Chicago.....	2.00	2.00	2.00	1.85
Steel bars, New York.....	2.29	2.29	2.24	2.09
Tank plates, Pittsburgh.....	1.90	1.90	1.90	1.75
Tank plates, Chicago.....	2.00	2.00	2.00	1.85
Tank plates, New York.....	2.22½	2.22½	2.22½	2.09
Beams, Pittsburgh.....	1.90	1.90	1.90	1.75
Beams, Chicago.....	2.00	2.00	2.00	1.85
Beams, New York.....	2.19½	2.19½	2.19½	2.09
Steel hoops, Pittsburgh.....	2.20	2.20	2.20	2.30

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	Nov. 5, 1928	Oct. 30, 1928	Oct. 9, 1928	Nov. 7, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh....	2.75	2.75	2.75	2.80
Sheets, black, No. 24, Chicago				
dist. mill.....	2.85	2.85	2.75	3.00
Sheets, galv., No. 24, P'gh....	3.50	3.50	3.50	3.70
Sheets, galv., No. 24, Chicago				
dist. mill.....	3.60	3.60	3.60	3.85
Sheets, blue, 9 & 10, P'gh....	2.00	2.00	2.00	2.10
Sheets, blue, 9 & 10, Chicago				
dist. mill.....	2.10	2.10	2.10	2.25
Wire nails, Pittsburgh.....	2.55	2.55	2.55	2.50
Wire nails, Chicago dist. mill..	2.60	2.60	2.60	2.55
Plain wire, Pittsburgh.....	2.40	2.40	2.40	2.40
Plain wire, Chicago dist. mill..	2.45	2.45	2.45	2.45
Barbed wire, galv., Pittsburgh	3.20	3.20	3.20	3.20
Barbed wire, galv., Chicago				
dist. mill.....	3.25	3.25	3.25	3.25
Tin plate, 100 lb. box, P'gh....	\$5.25	\$5.25	\$5.25	\$5.50

### Old Material, Per Gross Ton:

Heavy melting steel, P'gh....	\$17.50	\$17.75	\$17.50	\$14.00
Heavy melting steel, Phila....	15.50	16.00	16.00	14.00
Heavy melting steel, Ch'go....	14.50	14.50	14.00	11.50
Carwheels, Chicago.....	14.25	14.25	13.75	13.25
Carwheels, Philadelphia.....	16.50	16.50	16.50	15.50
No. 1 cast, Pittsburgh.....	15.50	15.50	15.00	14.25
No. 1 cast, Philadelphia.....	16.75	17.50	17.00	16.00
No. 1 cast, Ch'go (net ton)....	15.50	15.50	15.50	13.50
No. 1 RR. wrot., Phila.....	15.50	15.50	15.50	15.25
No. 1 RR. wrot., Ch'go (net)...	13.25	12.75	12.75	9.50

### Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt.....	\$2.90	\$2.90	\$2.75	\$2.75
Foundry coke, prompt.....	3.75	3.75	3.75	4.00

### Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	16.12½	16.25	15.25	13.37½
Electrolytic copper, refinery...	15.75	15.75	15.00	13.25
Zinc, St. Louis.....	6.25	6.25	6.25	5.65
Zinc, New York.....	6.60	6.60	6.60	6.00
Lead, St. Louis.....	6.32½	6.32½	6.32½	6.00
Lead, New York.....	6.50	6.50	6.50	6.25
Tin (Straits), New York.....	49.25	49.25	48.50	56.62½
Antimony (Asiatic), N. Y.....	10.50	10.50	11.50	11.00

## Pittsburgh

### Steel Backlogs Declining and Deliveries Are Less Extended —Pig Iron Makers Seek Still Higher Prices

PITTSBURGH, Nov. 5.—In point of mill engagement, the steel market is quite as active as it has been at any time recently, but the contraction in new commitments, which began in the second week of October, continues. With completed orders exceeding fresh bookings, backlogs are growing slimmer. Makers of sheets still profess inability to make shipments of the common finishes in less than two weeks without deferring deliveries on prior specifications, and the promise on full-finished sheets is four to five weeks. Strip makers are well obligated on probable production this month, but in bars and shapes makers have caught up with their orders to an extent that they now are promising reasonably prompt deliveries on new purchases.

The mills have at no time in the recent rush of business been seriously backward in deliveries of plates, wire products or tin plate, while the principal backlog business in pipe has been in that for oil and gas lines. A considerable tonnage of the latter is embraced in inquiries and projects now being discussed. One inquiry calls for 60,000 to 70,000 tons and two other projects nearing the inquiry stage will take fully 100,000 tons.

Rail orders for 1929 delivery are flowing steadily to the mills, and, with the election out of the way, it is be-

lieved that a large number of railroad cars and a goodly number of locomotives will come up for bids.

Taken as a whole, less steel is moving to the motor car builders than was true recently, and structural steel lettings to local fabricators remain very small. October was such a good month in shipments of finished steel products that it will occasion surprise if steel ingot production figures, when announced, do not show that October equaled the previous high record for the year in April. Given an order book such as the industry started with

last month, plus the urgency of shipments there was during that month, and pretty nearly all the available productive capacity is required. The maintenance of the October rate at present is due to the momentum of last month, but the general report as to business is that it has merely receded from the abnormal to the normal.

Prices still are very firm. The comment is heard that there could not have been as much of an advance in invoice prices as in quotations from the second to the third quarter of the year or earnings for the latter period would have made a better showing, seeing that high mill operations must have made for low producing costs.

Wire makers are considering a change in nails that will impose an extra of 10c. per 100 lb. on the carload buyer other than wholesale distributors.

The new base prices on hot-rolled flats do not include, as was at first supposed, cooperage stock, on which a new base of 2.10c. or \$2 a ton above the base on narrow strips, has been announced by some makers.

Producers of pig iron continue to seek higher prices, but have not yet

been successful in realizing the latest advances. Steel works scrap has gone down another 25c. per ton. Some melters who were expected to buy, and for delivery to whose plants dealers bought in advance of actual orders, have been able to get along without purchases, and pressure to sell the speculative shipments is largely responsible for the decline. The market also is weakened by the fact that some dealers, believing the upswing to be over, are selling short when they find a mill willing to pay \$17.50 for heavy melting steel.

**Ferroalloys.**—The contract price of spiegeleisen for the first half of next year will be the same as that for the past year, or \$30, furnace, for 19 to 21 per cent material. Current prices of all of the commonly used ferroalloys are to carry over into next year. There is a rather brisk spot demand for spiegeleisen, with sales of single carloads at \$33, furnace. Requirements of other alloys are being met largely through specifications on existing contracts. There is no rush by consumers to sign contracts for next year.

**Pig Iron.**—Producers are seeking higher prices, several having announced an advance of 50c. a ton on foundry iron to \$18, Valley furnace, for No. 2 grade, while for the malleable grade most makers want \$18.50, and on Bessemer as much as \$19 is asked. The common quotation on basic iron is \$18, Valley furnace, but the most recent sale, 4000 tons for December-January delivery to a Pittsburgh district steel company, was at \$17.50 and that was for an iron of somewhat special analysis. Similarly with other grades, the advanced quotations are yet to be realized. A few small sales of foundry iron have been made at \$18, base, Valley furnace, but a considerably larger tonnage is under quotation at \$17.50. To a large extent, quotations of \$18 for basic and \$19 for Bessemer merely indicate that the producers making them have none of these grades for sale at present. Interest in the market on the part of melters is not especially active, as most of them have sufficient iron under contract or in stock to see them

through the remainder of the year. The movement of iron on old orders is much heavier than strictly new business. W. P. Snyder & Co. make the average price of Bessemer iron at Valley furnaces in October \$17.53, compared with \$17.20 in September and \$18 in October last year, and of basic \$17.28, compared with \$16.50 one month ago and \$17 one year ago.

**Prices per gross ton, f.o.b. Valley furnace:**  
Basic ..... \$17.50 to \$18.00  
Bessemer ..... 18.00 to 19.00  
Gray forge ..... 17.00 to 17.50  
No. 2 foundry ..... 17.50 to 18.00  
No. 3 foundry ..... 17.00 to 17.50  
Malleable ..... 18.00 to 18.50  
Low phos., copper free.... 26.50 to 27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

**Wire Products.**—Some manufacturers have announced and others are considering adoption of a plan whereby jobbers shall be asked to pay one price for carload lots of nails and all other carload buyers an advance of 10c. per 100 lb. extra. The matter still is more or less in a state of flux. Nail and wire business is not holding up to its October gait, but is making a fairly good showing compared with this time last year. Prices are steady.

**Sheets.**—Except that makers are able to promise more prompt delivery on new orders than they could a few weeks ago, the situation shows no particular change. On black and galvanized sheets, bookings are sufficient to provide full engagement of capacity for two to three weeks and in blue annealed there is at least two weeks' business in sight. On automobile body sheets, leading makers are well sold up for the next four weeks. Incoming business is falling behind shipments, but there has been no let-down in mill operations, which remain at practically full physical capacity. Prices are firm.

**Fluorspar.**—Leading domestic producers have announced a price of \$18 per net ton, at mines, for gravel spar analyzing 85 per cent or more calcium fluoride and not over 5 per cent silica. It is figured that the recent increase in the duty on imported spar of \$2.50 per net ton will produce a price of \$18, Atlantic seaboard, for the imported material; on that basis foreign spar still can be delivered in this district

for less than the American product at \$18, mines, delivered by rail, but the latter will get the call on the score of more uniform quality and the fact that consumers may get supplies at shorter notice and will not be obliged to buy a cargo at a time. The freight charge on foreign spar from the seaboard to this district ranges from \$3.13 to \$3.48 per ton, while the rail rate from domestic mines is \$5.25, but much tonnage is brought to local consumers by river at a total charge of about \$3.50 per ton.

**Tin Plate.**—New business in packers' can sizes of tin plate waits on an announcement of the prices for the first half of next year. The fact that some container manufacturers will carry over stocks for which there was no use on account of the abrupt ending of the growing season this past fall is another reason for light forward interest. Much tin plate, however, is being moved to take care of the salmon pack of next spring, and export demands are of sizable proportions. Much interest is observed locally in a reopening of the case of the all-rail rate on tin plate to the Pacific Coast. A hearing will take place soon upon a plea of the Youngstown Sheet & Tube Co. for a reduction in the Chicago rate from 75c. per box to 65c. from its Chicago district plant to counterbalance the reduction of four months ago in the Pittsburgh rate to 75c. The Western railroads are opposing a reduction in the Chicago rate, and it is said an effort is being made to overcome the demand for a lower Chicago rate by lifting the Pittsburgh rate.

**Hot-Rolled Flats.**—Makers in this district expect this month to be good in strip production and shipments, since the common experience was that last month's shipments, which were of record size from most mills, were closely approximated by incoming business. Makers have firm price ideas on new business for early delivery because they do not need new business very badly. Application of the new base prices and the recently adopted card of extras appears to be more of a first quarter than a current matter. A separate base price for

## THE IRON AGE Composite Prices

### Finished Steel

Nov. 5, 1928, 2.369c. a Lb.

One week ago.....	2.369c.
One month ago.....	2.362c.
One year ago.....	2.293c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low
1928	2.369c., Oct. 30:	2.314c., Jan. 3	
1927	2.453c., Jan. 4:	2.293c., Oct. 25	
1926	2.453c., Jan. 5:	2.403c., May 18	
1925	2.560c., Jan. 6:	2.396c., Aug. 18	
1924	2.789c., Jan. 15:	2.460c., Oct. 14	
1923	2.824c., Apr. 24:	2.446c., Jan. 2	

### Pig Iron

Nov. 5, 1928, \$18.34 a Gross Ton

One week ago.....	\$18.25
One month ago.....	17.84
One year ago.....	17.54
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low
1928	\$18.34, Nov. 5:	\$17.04, July 24	
1927	19.71, Jan. 4:	17.54, Nov. 1	
1926	21.54, Jan. 5:	19.46, July 13	
1925	22.50, Jan. 13:	18.96, July 7	
1924	22.88, Feb. 26:	19.21, Nov. 3	
1923	30.86, Mar. 20:	20.77, Nov. 20	



# Mill Prices of Finished Iron and Steel Products

## Iron and Steel Bars

### Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.95c. to 2.00c.
F.o.b. Chicago.....	2.00c. to 2.10c.
Del'd Philadelphia.....	2.27c. to 2.32c.
Del'd New York.....	2.29c. to 2.34c.
Del'd Cleveland.....	1.92½c. to 2.05c.
F.o.b. Cleveland.....	1.90c. to 2.05c.
F.o.b. Lackawanna.....	2.05c. to 2.10c.
F.o.b. Birmingham.....	2.15c.
C.I.f. Pacific ports.....	2.35c. to 2.40c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

### Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50 and 60-ft. lengths.....	2.00c.
F.o.b. Pittsburgh mills, cut lengths.....	2.25c.
F.o.b. Birmingham.....	2.15c.

### Rail Steel

F.o.b. mills east of Chicago dist.....	1.85c.
F.o.b. Chicago Heights mill.....	1.95c.

### Iron

Common iron, f.o.b. Chicago.....	2.00c. to 2.10c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

## Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mills.....	1.90c. to 2.00c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.15c.
Del'd Cleveland.....	2.09c. to 2.19c.
Del'd Philadelphia.....	2.15c. to 2.25c.
F.o.b. Coatesville.....	2.05c. to 2.15c.
F.o.b. Sparrows Point.....	2.05c. to 2.15c.
F.o.b. Lackawanna.....	2.00c. to 2.10c.
Del'd New York.....	2.22½c. to 2.32½c.
C.I.f. Pacific ports.....	2.20c. to 2.30c.

## Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mills.....	1.90c. to 2.00c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.15c.
F.o.b. Lackawanna.....	2.00c. to 2.10c.
F.o.b. Bethlehem.....	2.05c. to 2.15c.
Del'd Cleveland.....	2.09c. to 2.19c.
Del'd Philadelphia.....	2.11c. to 2.21c.
Del'd New York.....	2.19½c. to 2.29½c.
C.I.f. Pacific ports.....	2.35c.

## Hot-Rolled Flats (Hoops, Bands and Strips)

	Base per Lb.
Narrower than 6 in., P'gh.....	2.00c.
6 in. and wider, P'gh.....	1.90c.
Narrower than 6 in., Chicago.....	2.10c.
6 in. and wider, Chicago.....	2.00c.

\*Mills follow plate or sheet prices according to gage on wider than 12 in.

## Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill.....	2.20c.
Bars, f.o.b. Chicago.....	2.20c.
Bars, Cleveland.....	2.25c.
Shafting, ground, f.o.b. mill.....	*2.55c. to 3.50c.
Strips, P'gh.....	2.35c.
Strips, Cleveland.....	2.35c.
Strips, del'd Chicago.....	3.15c.
Strips, Worcester.....	3.00c.
Fender stock, Pittsburgh.....	4.25c.

\*According to size.

## Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.55
Galvanized nails.....	4.55
Galvanized staples.....	3.25
Polished staples.....	3.00
Cement coated nails.....	2.55

### Base Per 100 Lb.

Bright plain wire, No. 9 gage.....	\$2.40
Annealed fence wire.....	2.55
Spring wire.....	3.40
Galv'd wire, No. 9.....	3.00
Barbed wire, galv'd.....	3.20
Barbed wire, painted.....	2.95

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester Mass., (wire) mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

## Woven Wire Fence

### Base to Retailers Per Net Ton

F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

## Sheets

### Blue Annealed

### Base per Lb.

Nos. 9 and 10, f.o.b. P'gh.....	2.00c.
Nos. 9 and 10, f.o.b. Chicago dist.....	2.10c.
Nos. 9 and 10, del'd Cleveland.....	2.19c.
Nos. 9 and 10, del'd Philadelphia.....	2.32c. to 2.42c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.15c.

### Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.75c.
No. 24, f.o.b. Chicago dist. mill.....	2.85c.
No. 24, del'd Cleveland.....	2.94c.
No. 24, del'd Philadelphia.....	3.07c. to 3.17c.
No. 24, f.o.b. Birmingham.....	2.90c.

### Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	3.85c. to 3.90c.
No. 24, f.o.b. Pittsburgh, B grade.....	3.65c. to 3.70c.

### Galvanized

No. 24, f.o.b. Pittsburgh.....	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill.....	3.60c.
No. 24, del'd Cleveland.....	3.69c.
No. 24, del'd Philadelphia.....	3.82c. to 3.92c.
No. 24, f.o.b. Birmingham.....	3.65c. to 3.70c.

### Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	2.90c.
No. 28, f.o.b. Chicago dist. mill.....	3.00c.

### Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.00c.
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### Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes.....	4.10c.
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### Tin Plate

Standard cokes, f.o.b. P'gh district mills.....	\$5.25
Standard cokes, f.o.b. Gary.....	5.35

### Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per Package 20 x 28 in.)

8-lb. coating I.C. \$11.20	25-lb. coating I.C. \$16.70
15-lb. coating I.C. 14.00	30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30	40-lb. coating I.C. 19.85

## Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quality Bar Base, 2.75c.

S.A.E. Series Numbers	Alloy Differential	Net Price 100 Lb. Bars
2000 (¼% Nickel).....	\$0.25	\$3.00
2100 (1½% Nickel).....	0.55	3.30
2300 (3½% Nickel).....	1.50	4.25
2500 (5% Nickel).....	2.25	5.00
3100 Nickel Chromium.....	0.55	3.30
3200 Nickel Chromium.....	1.35	4.10
3300 Nickel Chromium.....	3.80	6.55
3400 Nickel Chromium.....	3.20	5.95
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....	0.50	3.25
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....	0.70	3.45
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel).....	1.05	3.80
5100 Chromium Steel (0.60 to 0.90 Chromium).....	0.35	3.10
5100 Chromium Steel (0.80 to 1.10 Chromium).....	0.45	3.20
5100 Chromium Spring Steel.....	0.20	2.95
6100 Chromium Vanadium Bars.....	1.20	3.95
6100 Chromium Vanadium Spring Steel.....	0.95	3.70
9250 Silicon Manganese Spring Steel (flats).....	0.25	3.00
Rounds and squares.....	0.50	3.25
Chromium Nickel Vanadium.....	1.50	4.25
Carbon Vanadium.....	0.95	3.70

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a \$5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

### Rails

### Per Gross Ton

Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	36.00

## Track Equipment

### Base Per 100 Lb.

Spikes, ½ in. and larger.....	\$2.80
Spikes, ½ in. and smaller.....	2.80
Spikes, boat and barge.....	3.00
Tie plates, steel.....	2.15
Angle bars.....	2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....	.70 per cent off list

## Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

### Butt Weld

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
1½.....	45	19½	1½ to 2.....	+11	+39
2.....	51	25½	2½.....	22	2
2½.....	56	42½	3.....	25	11
3.....	60	48½	1 to 1½.....	30	13
1 to 3.....	62	50½			

### Lap Weld

2.....	55	43½	2.....	23	7
2½ to 6.....	59	47½	2½.....	26	11
7 and 8.....	56	43½	3 to 6.....	23	13
9 and 10.....	54	42½	7 to 12.....	26	11
11 and 12.....	53	40½			

### Butt Weld, extra strong, plain ends

1½.....	41	24½	1½ to 2.....	+19	+54
2.....	47	30½	2½.....	21	17
2½.....	53	42½	3.....	23	12
3.....	58	47½	1 to 1½.....	30	14
1 to 1½.....	60	49½			
2 to 3.....	61	50½			

### Lap Weld, extra strong, plain ends

2.....	53	42½	2.....	23	9
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	23	14
7 to 8.....	52	39½	7 to 8.....	21	7
9 and 10.....	45	32½	9 to 12.....	16	2
11 and 12.....	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

## Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel	Charcoal Iron
2 to 2½ in.....	27
2½ to 3 in.....	37
3 in.....	40
3½ to 4 in.....	42½
4 to 4½ in.....	46
5 to 6 in.....	40
1½ in.....	1½ in.....+18
2 in.....	2 in.....+8
2½ in.....	2½ in.....+2
3 in.....	3 in.....+7
3½ in.....	3½ in.....+9

Beyond the above base discounts, the following extra discounts are given:

Lap Weld Steel	Charcoal Iron
Under 5000 lb.....	4 Fives
5000 lb. to 12,000 lb.....	5 Fives
12,000 lb. to 21,000 lb.....	6 Fives
21,000 lb. and over.....	7 Fives
	2 Tens & 5

### Standard Commercial Seamless Boiler Tubes

### Cold Drawn

1 in.....	63	3 in.....	43
1½ to 1½ in.....	55	3½ to 3½ in.....	50
1½ in.....	39	4 in.....	53
2 to 2½ in.....	34	4½, 5 and 6 in.....	45
2½ to 2½ in.....	42		

### Hot Rolled

2 and 2½ in.....	40	3½ to 3½ in.....	56
2½ and 2½ in.....	48	4 in.....	59
3 in.....	54	4½, 5 and 6 in.....	48

Less carload, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

### Per Cent Off List

Carbon, 0.10% to 0.30%, base (carloads).....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

cooperage stock has been announced by some makers of this line, which embraces widths from  $\frac{1}{2}$  in. to  $1\frac{1}{4}$  in. in gages No. 17, 18 and 19, of 2.10c., base Pittsburgh, plus the extras in the recently announced card. Most users are under contract for the remainder of this year and the new base will find more general application on first quarter contracts. Some makers of 3-in. strips also have a separate base on that width of 2.10c.

**Cold-Rolled Strips.**—Makers here start the new month with good backlogs, and on ordinary current business are demanding 2.85c., base Pittsburgh, or \$2 a ton over the price at which the bulk of current shipments are invoiced.

**Semi-Finished Steel.**—There has been no letdown in sheet and strip mill operations, and a good movement of billets, slabs and sheet bars on contracts naturally results. Spot demands, however, do not amount to much, and while a premium of \$1 a ton for prompt shipments of billets was paid a short time ago, no such cases have recently come to light. Wire rods are steady at \$42, base Pittsburgh or Cleveland.

**Bars, Plates and Shapes.**—Incoming business in these products continues to lag behind shipments on older orders, and it is largely because producers had larger bookings than could be rolled and shipped last month that there has been no material reduction in mill operations. The common asking price for all three products is 2c., base Pittsburgh, but actual business at that price seems to be in single carloads for small buyers or for earlier shipment than most mills like to promise. The ordinary tonnage price—and most of the current inquiries are of the ordinary tonnage variety—is 1.95c. The large-lot or preferred buyer is drawing against contracts carrying 1.90c. or less, and the market is not now subject to the test of large in-

quiries. The cost of producing plates is as much of a factor of price and maintenance as the size of the demand.

**Rails and Track Supplies.**—The Carnegie Steel Co. was awarded 13,310 tons of the 191,550 tons of rails placed by the New York Central Lines, and now has a good backlog. Light-section rails are slow. Demand for track fastenings is light by comparison with the orders for standard-section rails.

**Tubular Goods.**—The Western Natural Gas Co., having completed organization, is expected to inquire soon for 350 miles of 20-in. pipe for a gas line to run from two gas producing fields in Wyoming to Salt Lake City. Line pipe furnishes most of the backlogs that the mills have, although there is a fairly good demand for seamless oil well pipe and a rather well sustained demand for butt-welded pipe. Lap-welded pipe for other than pipe lines is not very active.

**Cold-Finished Steel Bars and Shafting.**—October shipments were very heavy with makers in this district, but did not tax productive capacity. Third quarter contracts were well worked off in the heavy movement of last month. The advance of \$2 a ton is now well established by liberal specifications on fourth quarter contracts. Some doubt exists that another advance will be made for first quarter, although it is contended that the spread between hot-rolled and cold-finished bars is too narrow for fair profits.

**Coke and Coal.**—Spot furnace coke prices are unchanged, but as the supply situation is somewhat easier, sales at more than \$2.90 per net ton at ovens are becoming fewer. A local steel company which recently put on a blast furnace solved the problem of additional coke supplies by starting some of its old type ovens. Two blast furnaces and possibly a third now operating on Connellsville coke or coke made from Connellsville coal are likely to go out soon for relining and it will be a month at least before the Struthers furnace begins to take coke. Absorption of released coke should make for an easier market unless there is a corresponding reduction in output. Spot foundry coke is moving steadily at firm prices. There is no strength worthy of note in the coal market, because supplies are so plentiful in relation to requirements.

**Old Material.**—Dealers are finding it difficult to interest steel companies in new purchases of heavy melting steel. Some dealers had bought this grade for shipment to certain points in anticipation of mill purchases, but the mill orders did not materialize, and the dealers have forced the material on the market. The result has been a further decline of 25c. a ton. This grade now is offered at \$17.75 and even at \$17.50, with no takers. Few dealers have needs sufficiently pressing to pay more than \$17.25 to cover their sales. Two companies which were expected to buy scrap in the open market escaped the neces-

sity of doing so by purchases of billet and bloom crops, of which another steel company had a considerable accumulation. One company took 25,000 tons and the other, which secured a supply from still another steel company, bought 10,000 tons. Except for the offerings of scrap which have resulted from bad guessing on the part of some dealers, the supply is not materially greater than it has been. It is probable that the course of prices over the remainder of the year will be governed by the rate of steel works engagement. While incoming business in finished steel is somewhat less than shipments on orders, little recession in ingot production has developed. Continued high ingot output would force additional scrap buying, but the common belief is that there will be some falling off between now and the end of the year and that the mills will try to get along with their stocks and the material they have contracted for. About half of the heavy melting steel in this month's Pennsylvania Railroad list, it is reported, went to Youngstown at about \$18.80 and the remainder to this district at a price lower to the extent of the difference in the freight rates. About 2000 tons of heavy melting steel offered by this road in a special list recently was sold at more than \$19, delivered Youngstown. The November list of the Norfolk & Western contains 4911 gross tons.

*Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:*

Basic Open-Hearth Grades:	
Heavy melting steel.....	\$17.25 to \$17.75
Scrap rails .....	17.00 to 17.50
Compressed sheet steel.....	17.25 to 17.75
Bundled sheets, sides and ends .....	16.00 to 16.50
Cast iron carwheels.....	15.25 to 15.75
Sheet bar crops, ordinary.....	17.50 to 18.00
Heavy breakable cast.....	14.00 to 14.50
No. 2 railroad wrought.....	17.50 to 18.00
Heavy steel axle turnings.....	15.00 to 15.50
Machine shop turnings.....	11.50 to 12.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers.....	19.00 to 19.50
Railr. coil and leaf springs.....	19.00 to 19.50
Roller steel wheels.....	19.00 to 19.50
Low phos. billet and bloom ends .....	20.50 to 21.00
Low phos. mill plates.....	19.00 to 19.50
Low phos. light grade.....	18.00 to 18.50
Low phos. sheet bar crops.....	19.00 to 19.50
Hvy. steel axle turnings.....	15.00 to 15.50
Electric Furnace Grades:	
Low phos. punchings.....	18.50 to 19.00
Hvy. steel axle turnings.....	15.00 to 15.50
Blast Furnace Grades:	
Short shoveling steel turnings .....	12.25 to 12.50
Short mixed borings and turnings .....	12.25 to 12.50
Cast iron borings.....	12.25 to 12.50
No. 2 busheling.....	11.25 to 11.75
Rolling Mill Grades:	
Steel car axles.....	21.50 to 22.50
No. 1 railroad wrought.....	13.50 to 14.00
Sheet bar crops.....	18.00 to 18.50
Cupola Grades:	
No. 1 cast.....	15.50 to 16.00
Rails 3 ft. and under.....	18.00 to 18.50

Guarantee Specialty Mfg. Co., 5100 Superior Avenue, Cleveland, manufacturer of sheet metal stampings, has purchased a new site at the New York Central Railroad and East Ninety-sixth Street. Two factory buildings located on the property will be enlarged. Richard H. Wright is president and Albert C. Earhart is secretary. Additional press equipment will be required.

#### Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates .....	3.00c.
Structural shapes.....	3.00c.
Soft steel bars and small shapes.....	2.90c.
Reinforcing steel bars.....	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats.....	4.10c.
Bands .....	3.60c.
Hoops .....	4.00c. to 4.50c.
Black sheets (No. 24), 25 or more bundles .....	3.70c.
Galv. sheets (No. 24), 25 or more bundles .....	4.55c.
Blue ann'l'd sheets (No. 10), 1 to 10 sheets .....	3.35c.
Galv. corrug. sheets (No. 28), per square .....	\$4.43
Spikes, large.....	3.40c.
Small .....	3.80c. to 5.25c.
Boat .....	3.80c.
Track bolts, all sizes, per 100 count, 60 per cent off list	
Machine bolts, 100 count, 60 per cent off list	
Carriage bolts, 100 count, 60 per cent off list	
Nuts, all styles, 100 count, 60 per cent off list	
Large rivets, base per 100 lb. .....	\$3.50
Wire, black soft ann'l'd, base per 100 lb. ....	\$3.00 to 3.10
Wire, galv. soft, base per 100 lb. ....	3.00 to 3.10
Common wire nails, per keg .....	3.00
Cement coated nails, per keg .....	3.05



# Semi-Finished Steel, Raw Materials, Bolts and Rivets

## Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

### Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over.....	\$33.00
Rerolling, under 4-in. to and including 1 1/4-in. ....	34.00
Forging .....	38.00

### Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer.....	\$33.00

\*Cleveland mill base on large billets, slabs and sheet bars is \$33.

### Slabs

	Per Gross Ton
8 in. x 2 in. and larger.....	\$33.00
Smaller than 8 in. x 2 in.....	34.00

### Skelp

	Per Lb.
Grooved .....	1.90c. to 2.00c.
Sheared .....	1.90c. to 2.00c.
Universal .....	1.90c. to 2.00c.

### Wire Rods

	Per Gross Ton
*Common soft, base.....	\$42.00
Screw stock .....	\$5.00 per ton over base

\*Chicago mill base is \$43. Cleveland mill base, \$42.

## Prices of Raw Material

### Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15
Foreign Ore, c.i.f. Philadelphia or Baltimore	

Per Unit  
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian.....10.00c.

Iron ore, Swedish, average 66% iron, 9.25c. to 9.50c.

Manganese ore, washed, 52% manganese, from the Caucasus.....38c.

Manganese ore, Brazilian, African or Indian, basic 50% .....

Tungsten ore, high grade, per unit, in 60% concentrates .....

Per Gross Ton  
Chrome ore, 45 to 50% Cr<sub>2</sub>O<sub>3</sub>, crude, c.i.f. Atlantic seaboard .....

Per Lb.  
Molybdenum ore, 85% concentrates of MoS<sub>2</sub>, delivered .....

### Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt .....	\$2.90 to \$3.00
Foundry, f.o.b. Connellsville prompt .....	3.75 to 4.85
Foundry, by-product, Ch'go ovens.....	8.00
Foundry, by-product, New England, del'd .....	11.00
Foundry, by-product, Newark or Jersey City, delivered.....	9.00 to 9.40
Foundry, Birmingham.....	5.00
Foundry, by-product, St. Louis, f.o.b. ovens .....	8.00
Foundry by-prod., del'd St. Louis.....	9.00

### Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines .....	\$1.40 to \$1.80
Mine run coking coal, f.o.b. W. Pa. mines .....	1.50 to 1.75
Gas coal, 1/4-in., f.o.b. Pa. mines.....	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines.....	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines.....	60c. to 80c.
Gas slack, f.o.b. W. Pa. mines.....	90c. to 1.10

### Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard.....	\$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid .....	105.00

### Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21% .....	\$30.00 to \$33.00
Domestic, 16 to 19% .....	29.00 to 32.00

### Electric Ferrosilicon

	Per Gross Ton Delivered
50% .....	\$83.50
75% .....	130.00
	Per Gross Ton Furnace
10% .....	\$35.00
11% .....	37.00
12% .....	\$39.00
14 to 16% .....	45.00

### Bessemer Ferrosilicon

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	
10% .....	\$30.00
11% .....	32.00
12% .....	\$34.00

### Silvery Iron

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	
6% .....	\$23.00
7% .....	24.00
8% .....	25.00
9% .....	26.00
10% .....	\$28.00
11% .....	30.00
12% .....	32.00

### Other Ferroalloys

Ferrotungsten, per lb., contained metal del'd .....	95c. to 98c.
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads.....	11.00c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace.....	\$3.15 to \$3.65
Ferrocobalt, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton.....	\$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton.....	\$122.50

### Fluxes and Refractories

#### Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$18.00
No. 2 lump, Illinois and Kentucky mines.....	18.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid.....	16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silica, f.o.b. Illinois and Kentucky mines.....	32.50

#### Fire Clay

	Per 1000 f.o.b. Works
First Quality	
Pennsylvania .....	\$43.00 to \$46.00
Maryland .....	43.00 to 46.00
New Jersey .....	50.00 to 65.00
Ohio .....	43.00 to 46.00
Kentucky .....	43.00 to 46.00
Missouri .....	43.00 to 46.00
Illinois .....	43.00 to 46.00
Ground fire clay, per ton .....	7.00

#### Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania .....	\$43.00
Chicago .....	52.00
Birmingham .....	50.00
Silica clay, per ton.....	\$8.50 to 10.00

#### Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.....	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.....	40.00
Standard size .....	45.00

#### Chrome Brick

	Per Net Ton
Standard size .....	\$45.00

## Mill Prices of Bolts, Nuts, Rivets and Set Screws

### Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts .....	70
†Carriage bolts .....	70
Lag bolts .....	70
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	70
Hot-pressed nuts, blank or tapped, square.....	70
Hot-pressed nuts, blank or tapped, hexagons.....	70
C.p.c. and t. square or hex. nuts, blank or tapped .....	70
Washers* .....	7.00c. to 6.75c. per lb. off list

\*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including 1/2 in. x 6 in. take 10 per cent lower list prices.

### Bolts and Nuts

Per Cent Off List

Semi-finished hexagon nuts.....	70
Semi-finished hexagon castellated nuts, S.A.E.....	70
Stove bolts in packages, Pittsburgh.....	80, 10 and 2 1/2
Stove bolts in packages, Chicago.....	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh.....	80, 10 and 5
Stove bolts in bulk, Chicago.....	75, 20, 10, 5 and 2 1/2
Tire bolts .....	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

### Large Rivets

(1/2-In. and Larger)

	Base Per 100 Lb.
F.o.b. Pittsburgh or Cleveland.....	\$2.90
F.o.b. Chicago .....	3.00

### Small Rivets

(1/8-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh .....	70 and 10
F.o.b. Cleveland .....	70 and 10
F.o.b. Chicago .....	70 and 10

### Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws .....	80, 10 and 10
Milled standard set screws, case hardened, 80 and 10 .....	80 and 10
Milled headless set screws, cut thread.....	80
Upset hex. head cap screws, U.S.S. thread, 85 and 5 .....	85 and 5
Upset hex. cap screws, S.A.E. thread.....	85 and 5
Upset set screws.....	80, 10 and 10
Milled studs .....	70 and 5

# Chicago

## Steel Sales Again Reach a High Point—Pig Iron Advanced Second Time in Two Weeks

CHICAGO, Nov. 5.—Added needs of miscellaneous steel users, plus heavy purchases of standard-section rails, have brought sales in this district to the highest point of the year and, with one exception, to the highest point in three years. Specifications are fully equal to shipments, which represent ingot output at a shade above 85 per cent of capacity. Forward buying is more active, though 30 to 60 days' requirements is still representative of the average buyer's order. Ingot output is now about 17 per cent higher than a year ago. In September, 1927, both backlogs and shipments began to diminish and little or no improvement occurred in October. This year, ingot output has gradually increased during the fall weeks, and the first week of November finds local mills well entrenched, with the outlook favorable for a sustained rate of shipments. Prices for plates, shapes and bars are stronger, as quotations tend to narrow to a range of 2.05c. to 2.10c. per lb., Chicago.

The railroad equipment market remains active, with inquiries for 9620 cars now pending and considerably more in prospect. Structural awards are not keeping pace with other steel activities, but shops remain well engaged on orders taken in the late summer and early fall.

Pig iron prices, after remaining for a few days at \$19.50 a ton, Chicago furnace, have been advanced another 50c. to \$20 a ton. Liberal purchases have been made at the higher quotations. The scrap market, though recently affected by weakness in the East, has again been strengthened by heavy sales locally.

**Pig Iron.**—Northern No. 2 iron, after holding a short time at \$19.50 a ton, local furnace, has been advanced to \$20. Numerous sales in large and small lots establish prices at the higher level. A user in Wisconsin will buy 3000 to 5000 tons for first quarter delivery and three nearby foundries will take a total of 3000 tons for delivery over the remainder of the year. Shipments in October were the heaviest in any month so far this year; producers, in analyzing shipping orders on hand, estimate that deliveries from local furnaces in 1928 will establish a record for all time. Sales of Southern iron are frequent at \$22.26 a ton, delivered Chicago. This iron reaches many points of consumption in this territory at a disadvantage in price of not over 50c. a ton. Quotations at \$16.25 a ton, Birmingham, are strong. Demand for charcoal iron is insistent and furnace stocks are smaller and unbalanced. Prices are steady at \$24 a ton, furnace.

*Prices per gross ton at Chicago:*

N'th'n No. 2 fdy., sil. 1.75 to 2.25..	\$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75..	20.50
Malleable, not over 2.25 sil.....	20.00
High phosphorus .....	20.00
Lake Super. charcoal, sil. 1.50.....	27.04
So'th'n No. 2 fdy. (all rail).....	22.26
Low phos., sil. 1 to 2, copper free .....	\$29.00 to 29.50
Silvery, sil. 8 per cent.....	29.79
Bess. ferrosilicon, 14-15%.....	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

**Ferrolloys.**—Contracting for 1929 in ferrosilicon is practically complete, and the bulk of users of ferromanganese have also stated their needs for the coming year. All told, not less

than 12,000 tons of ferromanganese has been added to sellers' books. Carload sales of spiegeleisen in the 19 to 21 per cent grade are being made at \$33, Hazard, Pa.

*Prices delivered Chicago:* 80 per cent ferromanganese, \$112.56; 50 per cent ferrosilicon, \$83.50 to \$88.50; spiegeleisen, 19 to 21 per cent, \$40.76.

**Plates.**—Active inquiry for railroad cars now in this market totals not less than 9620 cars, which will require about 140,000 tons of steel. The most recent request for prices comes from the Wabash, which will buy 2000 box cars. It is believed by the local trade that part of the steel needed for 3300 cars to be purchased by Canadian carriers will be furnished by Chicago mills. A check made by Western steel producers leads them to believe that not less than 40,000 cars will be in the market before the end of the year and that about one-half of that number will have been placed by Jan. 1. Reports here are that the Santa Fe inquiry will be for 6000 cars, and the Illinois Central is expected to call for bids on 2500 cars. Users of plates expect that deferred deliveries will result from the probable requirements of car builders, and new buying is for more distant needs. Plate mills are now engaged at 80 per cent of capacity. The Texas Corporation is in the market for 2800 tons and the Roxana Petroleum Corporation will buy 2000 tons for tanks. Oil storage tank construction programs are being rushed, and orders placed at mills are usually for immediate shipment. Deliveries on the more common widths of plates range from two to five weeks. Prices in this market are strengthening, and quotations of 2c. per lb., Chicago, are no longer obtainable except on the most desirable business. A more frequent quotation is 2.05c., while 2.10c. is more common than a week ago.

*Mill prices on plates, per lb.: 2c. to 2.10c. base Chicago.*

**Bars.**—Orders for mild steel bars are unabated. Automobile parts makers appear to have hit a uniform stride and specifications from that source have not diminished in the last 10 days. Several new models which are to make their appearance this month will call for increased quantities of steel at an early date. Orders

for heavy forgings are well sustained and shops hold close to capacity output. Farm implement manufacturers are swinging into production for spring delivery, and their steel requirements are measurably larger. Prices for mild steel bars are stronger at 2.05c., Chicago, which is rapidly taking the place of 2c. for all but the most attractive business. The iron bar market is without feature. Demand for alloy steel bars is steady and prices are unchanged. Specifications in October for rail steel bars were fully equal to production, which compared favorably with the best months so far this year. New orders are in good total volume, but are individually small and do not afford economical operation. Improved demand is noted from the bed trade, and shipments to barn equipment manufacturers are in good volume. Prices are firm at 1.95c. a lb., Chicago Heights.

*Mill prices per lb.: Soft steel bars, 2c. to 2.10c., base, Chicago; common bar iron, 2c. to 2.10c., base, Chicago; rail steel bars, 1.95c., base, Chicago Heights mill.*

**Cast Iron Pipe.**—Three makers of cast iron pipe participated in a contractor's job at Waukegan, Ill. The orders totaled 300 tons and they were taken at \$45.50 a ton, delivered, or \$37, Birmingham. Current orders by railroads seldom reach car lot proportions. Contractors in the North Central States are active on old jobs and the bulk of pipe purchased late in the summer has been delivered.

*Prices per net ton, deliv'd Chicago:* Water pipe, 6-in. and over, \$45.20; 4-in., \$49.20; Class A and gas pipe, \$4 extra.

**Structural Material.**—Preliminary estimates of the steel needed by the Youngstown Sheet & Tube Co. for extensions to its Indiana Harbor, Ind., plant are placed at 8000 tons, but it is believed that this may be increased by at least 1000 tons. Bridge work, both highway and railroad, is unusually active. Contracts for two highway bridges in Wisconsin call for 2500 tons and a like tonnage will be needed for a bridge at Liberty Bend, Mo. The Northern Pacific will buy 1200 tons for miscellaneous bridge work. A Chicago architect is preparing plans for a warehouse that will require about 10,000 tons. Fabricating shops are busy for this time of the year, but most operations are being sustained by work taken earlier in the year. The pending list is large, but contracting is slow except in small tonnage business. An increase is noted in inquiry for jobs requiring less than 100 tons each. Prices obtained by fabricators are low and no strengthening influence is in sight.

*Mill prices on plain material, per lb.: 2c. to 2.10c. base, Chicago.*

**Reinforcing Bars.**—Transactions in this market in the past week were confined largely to orders of less than 100 tons each. The pending list is formidable, and there is now fully as much tonnage on which estimates have been made as there was in the first week of November, 1927. Awards in October were not as heavy as in the corresponding month of 1927. A substantial volume of business in late



summer brought October deliveries to a higher level than a year ago.

**Wire Products.**—Demand for nails has improved, but lags behind shipments. Manufacturers continue to take liberal quantities of wire. The jobbing trade is spotty, though some improvement is shown in orders from the Northwest and the South. Jobbers continue to buy at close range. Prompt delivery is expected, and producers are forced to carry large and well balanced stocks. Spring terms on woven wire fencing are announced for Nov. 5.

**Rails and Track Supplies.**—Local mills have taken orders for 185,000 tons of rails. This figure includes the allotments by the New York Central, which placed a total of 191,550 tons, of which 70 per cent is for immediate specification and the remainder is taken on option. The distribution is as follows: Bethlehem Steel Co., 82,030 tons; Dominion Iron & Steel Corporation, 11,690 tons; Carnegie Steel Co., 13,310 tons; Illinois Steel Co., 69,140 tons, and Inland Steel Co., 15,380 tons. The Chicago & North Western inquiry for 30,000 tons is still open. Total inquiry now before local sellers is for 150,000 tons. Although rail buying started earlier than last year, it has not progressed as rapidly as it did in the fall of 1927. Accessory purchases in the week reached 3500 tons for immediate needs and 10,000 tons for future delivery. Fresh inquiry totals 20,000 tons. Prices for tie plates are steady at \$43 a ton. Rail mill output averages a shade above 50 per cent of capacity.

*Prices f.o.b. mill, per gross ton:* Standard-section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

**Old Material.**—A Chicago mill has closed for 25,000 tons of heavy melting steel at \$15 a gross ton, delivered. Dealers are trading in this grade at \$14.85 to \$15.10 a gross ton, delivered. Lower prices in the East shook confidence a trifle, but after a temporary halting of sales the Chicago market again became active and a number of grades have been sold at

higher prices. Scrap is moving rapidly and unloading tracks are congested at several consuming points. Large shipments of heavy melting steel are moving to Gary mills. The cast iron borings market is strong. Sales have been heavy, and brokers are busy covering their obligations. A producer is asking \$12.75 a ton for November delivery and 25c. higher for shipments in December. Inquiry by malleable and gray iron foundries is unusually active, but individual sales are small, as users decline to carry stocks larger than immediate needs dictate. In some cases buyers are offering stiff resistance to current prices.

*Prices deliv'd Chicago district consumers: Per Gross Ton*

Basic Open-Hearth Grades:	
Heavy melting steel.....	\$14.50 to \$15.00
Shoveling steel.....	14.50 to 15.00
Frogs, switches and guards, cut apart, and misc. rails	15.75 to 16.25
Hydraul. compressed sheets	12.50 to 13.00
Drop forge flashings.....	10.50 to 11.00
Forg'd, cast and r'd steel carwheels.....	17.75 to 18.25
Rail'd tires, charg. box size.....	17.50 to 18.00
Rail'd leaf spring cut apart.....	17.25 to 17.75
Acid Open-Hearth Grades:	
Steel couplers and knuckles	16.00 to 16.50
Coil springs.....	18.25 to 18.75
Electric Furnace Grades:	
Axle turnings.....	14.00 to 14.50
Low phos. punchings.....	16.00 to 16.50
Low phos. plate, 12 in. and under.....	15.50 to 16.00
Blast Furnace Grades:	
Axle turnings.....	12.00 to 12.50
Cast iron borings.....	12.00 to 12.50
Short shoveling turnings.....	12.00 to 12.50
Machine shop turnings.....	7.50 to 8.00
Rolling Mill Grades:	
Iron rails.....	15.00 to 15.50
Rerolling rails.....	17.00 to 17.50
Cupola Grades:	
Steel rails less than 3 ft..	17.50 to 18.00
Angle bars, steel.....	16.50 to 17.00
Cast iron carwheels.....	14.25 to 14.50
Malleable Grades:	
Railroad.....	15.75 to 16.25
Agricultural.....	12.50 to 13.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav. ....	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angles and splice bars	14.50 to 15.00
Iron arch bars and transoms.....	20.50 to 21.00
Iron car axles.....	26.50 to 27.00
Steel car axles.....	15.50 to 16.00
No. 1 railroad wrought....	13.25 to 13.75
No. 2 railroad wrought....	13.00 to 13.50
No. 1 busheling.....	11.50 to 12.00
No. 2 busheling.....	6.00 to 6.50
Locomotive tires, smooth..	13.25 to 13.75
Pipes and flues.....	9.50 to 10.00
Cupola Grades:	
No. 1 machinery cast.....	15.50 to 16.00
No. 1 railroad cast.....	14.50 to 15.00
No. 1 agricultural cast....	14.00 to 14.50
Stove plate.....	11.75 to 12.25
Grate bars.....	12.50 to 13.00
Brake shoes.....	11.75 to 12.25

\*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

**Sheets.**—Prices are firm, and deliveries average not better than four weeks, with hot mills engaged at 85 per cent of capacity. Light tank manufacturers are taking liberal quantities, but the roofing trade continues to lag behind its usual seasonal activity. Jobbers are distributing a heavy tonnage, but they hold stocks low and depend on mill deliveries to meet current requirements. Backlogs are growing small and in the past few

days specifications have totaled less than production. Spot sales are few in number and of small individual size.

*Base prices per lb., deliv'd from mill in Chicago:* No. 24 black sheets, 2.90c.; No. 24 galv., 3.65c.; No. 10 blue ann'd, 2.15c. Deliv'd prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

**Coke.**—Shipments remain heavy and all ovens in this district are lighted. Quotations for by-product foundry coke are firm at \$8 a ton, local ovens.

**Bolts, Nuts and Rivets.**—The upturn in specifications noticed a week ago did not hold its ground under the influence of a marked decrease in demand from railroads. Agricultural implement manufacturers, however, are taking liberal quantities. Prices for these commodities are firm.

## Ryerson Company Offers Securities to Public

Joseph T. Ryerson & Son, Chicago, on Nov. 2 ceased to be a closed family institution with the offering for public subscription of \$5,000,000 in debentures and 100,000 shares of capital stock. A new corporation known as Joseph T. Ryerson & Son, Inc., has been formed and the financing arises out of the sale of a portion of the Ryerson family holdings. The management of this corporation will remain unchanged. The debentures will be offered at 96 and interest to yield over 5% per cent, and the stock will be offered at \$39 a share.

The Ryerson business heretofore has not made public its earning statement, due to private ownership. In connection with the financing, net earnings for this year based on operations to Sept. 30 are estimated at \$2,102,000 before Federal taxes. For 1927, net was \$1,669,360. The business was started in 1842 with capital of \$10,000.

## Factory Earnings Near a Record

Average weekly earnings in representative factories in New York State are reported by the State Industrial Commissioner to have been \$29.72 in September. This is the second highest figure ever reached, having been exceeded only by the \$29.78 of March, 1927. The gain over August was 34c., while the September figure was 15c. higher than a year earlier. All employees, including both shop and office, are covered in the returns.

Lamson & Sessions Co., Cleveland, will build a bolt and nut manufacturing plant at Birmingham to supply its Southern and Southwestern trade. An 8-acre site has been acquired in North Birmingham and the erection of a moderate sized plant will be started shortly for the manufacture of a complete line of bolts and nuts.

## Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforc'g bars, billet steel.....	2.10c. to 2.50c.
Reinforc'g bars, rail steel.....	1.85c. to 2.40c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands.....	3.65c.
Hoops.....	4.15c.
Black sheets (No. 24).....	3.80c.
Galv. sheets (No. 24).....	4.65c.
Blue ann'd sheets (No. 10).....	3.35c.
Spikes, stand. railroad.....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	3.60c.
Rivets, boiler.....	3.60c.
Per Cent Off List	
Machine bolts.....	60
Carriage bolts.....	60
Coach or lag screws.....	60
Hot-pressed nuts, sq., tap. or blank..	60
Hot-pressed nuts, hex., tap. or blank..	60
No. 8 black ann'd wire, per 100 lb..	\$3.30
Com. wire nails, base per keg.....	3.10
Cement c'd nails, base per keg.....	3.10

# New York

## Gas Line to Take 60,000 Tons of Pipe—Pig Iron Prices Still Show Rising Tendency

NEW YORK, Nov. 5.—Pig iron demand is well sustained. Although purchases for first quarter are on the increase, orders are still predominantly for early delivery. Sales in this district during the week totaled more than 14,000 tons. In the main, prices still show a rising tendency. Buffalo foundry iron is firm at \$17.50, base furnace, and a leading producer has announced an advance of 50c. to \$18, effective immediately. Eastern Pennsylvania makers have advanced foundry iron to \$21, base furnace, for first quarter. Quotations on current business, however, have not been entirely uniform. A sale in New Jersey last week brought out a price that figured back to less than \$20, base eastern Pennsylvania furnace. The New York Air Brake Co. is inquiring for 500 tons of malleable, 100 tons of low phosphorus, 100 tons of high manganese and 50 tons of silvery for its Watertown, N. Y., plant. The American Locomotive Co. is in the market for 200 tons of foundry for its Schenectady, N. Y., works. A Connecticut melter wants 1000 tons of foundry iron for delivery in the current quarter. Abendroth Brothers, Port Chester, N. Y., have closed for 250 tons each of No. 2X and No. 1X, and the Foran Foundry & Mfg. Co., Flemington, N. J., has bought 500 tons each of No. 2 plain and No. 2X.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil.	1.75	
to 2.25		\$22.41
*Buf. No. 2, del'd east.		
N. J.		20.78
East. Pa. No. 2 fdy., sil.		
1.75 to 2.25	21.39 to	22.52
East. Pa. No. 2X fdy., sil.		
2.25 to 2.75	21.89 to	23.02
East. Pa. No. 1X fdy., sil.		
2.75 to 3.25	22.39 to	23.52

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

\*Price delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

**Plates, Shapes and Bars.**—The Export Steamship Co., 25 Broadway, New York, opened bids Monday on four 10,000-ton freight boats to be built under the loan provisions of the recently enacted Merchant Marine Bill. An award to a shipbuilding company probably will be made within a few days. The four boats will take 13,000 tons of steel, mostly plates. Other boats of larger tonnage are to be submitted for bids by the same company within a short time. The demand for plates, shapes and bars is steady. Structural steel lettings of the week were in fair aggregate volume, though no individual awards of outstanding size were included. The common price for plates is 2.27½c., New York, but large buyers are being supplied at \$1 a ton less and small buyers are paying \$1 a ton more. The minimum on shapes is 2.19½c., New York, some buyers paying \$1 or \$2 a ton additional. The steel bar price

is strong at 2c., Pittsburgh, for current small lots not covered by contract. Contract customers are being supplied at 1.90c. and 1.95c., Pittsburgh.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.29c. to 2.34c.; plates, 2.22½c. to 2.27½c.; struc. shapes, 2.19½c. to 2.22½c.; bar iron, 2.14c. to 2.24c.

**Pipe.**—The Texas Corporation has inquired for 530 miles of 12½-in. o.d.

### Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.50c.
Flats and squares	4.00c.
Cold-roll. strip, soft and quarter	
hard	5.15c. to 5.40c.
Hoops	4.50c.
Bands	4.00c.
Blue ann'l'd sheets (No. 10)	3.85c. to 3.90c.
Long terme sheets (No. 24)	5.60c. to 5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ½ in.	
and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Machine bolts, cut thread:	Per Cent
¾ x 6 in. and smaller	Off List
1 x 30 in. and smaller	.50 to 50 and 10
Carriage bolts, cut thread:	
¾ x 6 in. and smaller	.60
¾ x 20 in. and smaller	.50 to 50 and 10
Coach screws:	
¾ x 6 in. and smaller	.60
1 x 16 in. and smaller	.50 to 50 and 10
Bolter Tubes—	Per 100 Ft.
Lap welded, 2-in.	\$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00
<b>Discounts on Welded Pipe</b>	
<b>Standard Steel—</b>	Black Galv.
½-in. butt.	46 29
¾-in. butt.	51 37
1-3-in. butt.	53 39
2½-6-in. lap.	48 35
7 and 8-in. lap.	44 17
11 and 12-in. lap.	37 12
<b>Wrought Iron—</b>	
½-in. butt.	5 +19
¾-in. butt.	11 + 9
1-1½-in. butt.	14 + 6
2-in. lap.	5 +14
3-6-in. lap.	11 + 6
7-12-in. lap.	3 +16
<b>Tin Plate (14 x 20 in.)</b>	
	Prime Seconds
Coke, 100 lb. base box	\$6.45 \$6.20
Charcoal, per Box—	A AAA
IC	\$9.70 \$12.10
IX	12.00 14.25
IXX	13.90 16.00
<b>Terne Plate (14 x 20 in.)</b>	
IC—20-lb. coating	\$10.00 to \$11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25
<b>Sheets, Box Annealed—Black, C. R.</b>	
	One Pass Per Lb.
Nos. 18 to 20	3.60c. to 3.80c.
No. 22	3.75c. to 3.95c.
No. 24	3.80c. to 4.00c.
No. 26	3.90c. to 4.10c.
No. 28*	4.05c. to 4.25c.
No. 30	4.30c. to 4.50c.
<b>Sheets, Galvanized</b>	Per Lb.
No. 14	4.15c. to 4.35c.
No. 16	4.00c. to 4.20c.
No. 18	4.15c. to 4.35c.
No. 20	4.30c. to 4.50c.
No. 22	4.35c. to 4.55c.
No. 24	4.50c. to 4.70c.
No. 26	4.75c. to 4.95c.
No. 28*	5.00c. to 5.20c.
No. 30	5.40c. to 5.60c.

	Prime	Seconds
Coke, 100 lb. base box	\$6.45	\$6.20
Charcoal, per Box—	A	AAA
IC	\$9.70	\$12.10
IX	12.00	14.25
IXX	13.90	16.00

	Terne Plate (14 x 20 in.)
IC—20-lb. coating	\$10.00 to \$11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

	Sheets, Box Annealed—Black, C. R.
	One Pass

	Per Lb.
Nos. 18 to 20	3.60c. to 3.80c.
No. 22	3.75c. to 3.95c.
No. 24	3.80c. to 4.00c.
No. 26	3.90c. to 4.10c.
No. 28*	4.05c. to 4.25c.
No. 30	4.30c. to 4.50c.

	Per Lb.
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No. 22	4.35c. to 4.55c.
No. 24	4.50c. to 4.70c.
No. 26	4.75c. to 4.95c.
No. 28*	5.00c. to 5.20c.
No. 30	5.40c. to 5.60c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

pipe for a gas pipe line to connect Tulsa, Okla., with Lockport, Ill., amounting to 60,000 to 70,000 tons, but the award is understood to be dependent on the outcome of negotiations for the marketing of the gas. Two or three other gas lines, which will take upward of 100,000 tons of pipe, are also in a tentative stage.

**Sheets.**—A good many consumers whose specifications in September were believed to be sufficiently heavy to cover a considerable part of their fourth quarter requirements have come into the market for additional supplies, and their orders have been booked at the current prices, which are higher in the case of black and galvanized sheets than the invoice prices of recent shipments. Although mills have made no announcement regarding first quarter prices, an advance of \$2 a ton on some grades seems to be expected. The volume of current business is very satisfactory in view of the heavy commitments still to be discharged from mill books. Prices are firm at Pittsburgh bases of 2.75c. for black, 3.50c. for galvanized and 2c. to 2.10c. for blue annealed, depending on width.

**Reinforcing Bars.**—Business has been rather quiet in the last week, the majority of the jobs placed having called for less than 100 tons. No action has been taken on the Delaware, Lackawanna & Western Railroad terminal at Jersey City, calling for 8500 tons. No new projects of outstanding size have come before the trade recently, but the tonnage in pending jobs bulks large for this time of year. Prices are unchanged.

**Cast Iron Pipe.**—The market is very quiet, but improvement in municipal lettings is expected after the election, involving projects to be voted upon by the electorate. Warwick, R. I., has not yet awarded 14,000 tons, on which the New York agent for the French maker is low bidder, and action may be postponed for some time. Hartford, Conn., has awarded 80 tons of 6 to 12-in. pipe and fittings to an unnamed maker, and R. D. Wood & Co. are low bidders on a small tonnage of 12-in. pipe for New Brunswick, N. J. Prices are unchanged, with Northern foundries continuing to quote a wide range on competitive jobs.

Prices per net ton, deliv'd New York: Water pipe, 6-in. and larger, \$35.60 to \$36.60; 4-in. and 5-in., \$40.60 to \$41.60; 3-in., \$50.60 to \$51.60; Class A and gas pipe, \$4 to \$5 extra.

**Coke.**—Demand for foundry coke continues rather brisk, with prices unchanged at \$3.50 to \$3.75 per net ton, Connellsville. The standard furnace grade is firm at \$2.85 to \$3.05, Connellsville, but the market is very quiet, largely on account of the continuing warm weather. Standard brands are unchanged at \$4.85 per net ton, ovens, or \$8.56, delivered to northern New Jersey, Jersey City and Newark, and \$9.44, to New York or Brooklyn. By-product foundry coke prices are \$9 to \$9.40, Newark or Jersey City, and \$10.06, New York or Brooklyn.



**Warehouse Business.**—Jobbers report continued activity and less weakness in prices. Black sheets are quite firm and galvanized sheet prices are being maintained better than for several months, although concessions are still obtainable. Business in structural material and bars is good and some substantial orders have been taken in the past week.

**Old Material.**—Buying prices have developed a downward movement in the past week, with most grades of scrap 25c. to 50c. a ton lower. A broker shipping No. 1 heavy melting steel to Bethlehem, Pa., is offering \$14.50 per ton, delivered, 50c. less than the previous buying price. Practically no buying is being done for shipment to other eastern Pennsylvania consumers of No. 1 steel. Yard grade is quoted at \$12 per ton, Pottsville, Pa., a reduction of 50c. a ton, but a broker acting as buying agent for a Phoenixville consumer is still paying up to \$13 per ton, delivered. It is difficult to determine the price of heavy breakable cast as the two leading consumers at Harrisburg, Pa., and Florence, N. J., are not accepting shipments. Blast furnace

scrap is quoted at \$9.50 per ton, delivered Bethlehem, Pa., and machine shop turnings at \$11.50 per ton, delivered Phoenixville, Pa. Specification pipe for a Lebanon, Pa., consumer has been reduced 50c. a ton to \$14.50 per ton, delivered.

*Dealers' buying prices per gross ton, f.o.b. New York:*

No. 1 heavy melting steel	\$11.75 to \$12.25
Heavy melting steel (yard)	8.25 to 9.50
No. 1 hvy. breakable cast	11.25 to 11.75
Stove plate (steel works)	8.75 to 9.00
Locomotive grate bars	9.25 to 10.25
Machine shop turnings	7.50 to 8.00
Short shoveling turnings	7.50 to 8.00
Cast borings (blast furn. or steel works)	6.50 to 7.00
Mixed borings and turnings	6.25 to 6.75
Steel car axles	18.00 to 18.50
Iron car axles	25.25 to 26.25
Iron and steel pipe (1 in. dia., not under 2 ft. long)	10.75
Forge fire	8.00 to 8.50
No. 1 railroad wrought	12.25 to 12.75
No. 1 yard wrot, long	11.25 to 11.75
Rails for rolling	13.50 to 14.00
Cast iron carwheels	13.00 to 13.50
Stove plate (foundry)	9.50
Malleable cast (railroad)	10.00 to 10.50
Cast borings (chemical)	11.25

*Prices per gross ton, deliv'd local foundries:*

No. 1 machry. cast	\$17.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size	15.00
No. 2 cast (radiators, cast boilers, etc.)	14.50

and some producers have about cleaned out the large stock piles they had a few months ago. Pickands, Mather & Co. on Monday blew in a furnace in Toledo, which had been out for relining.

*Prices per gross ton at Cleveland:*

N'th'n fdy., sil. 1.75 to 2.25	\$19.50
S'th'n fdy., sil. 1.75 to 2.25	22.25
Malleable	19.50
Ohio silvery, 8 per cent.	28.00
Basic Valley furnace	\$17.50 to 18.00
Stand. low phos., V'ley fur.	26.50 to 27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

**Iron Ore.**—An exceedingly tight market has developed through the scarcity of vessel tonnage. Ore firms could easily supply all the additional ore that might be needed were they able to ship it before navigation closes. The scarcity of basic pig iron and the advance in pig iron prices have caused the Struthers Furnace Co., Struthers, Ohio, to decide to blow in its stack about Dec. 1, but this furnace had considerable difficulty in finding ore that can be delivered this year. Ore firms have their vessels scheduled for ore cargoes until the close of the navigation season, although at present rates they would find it more profitable to divert some of their boats to the grain trade. Much of the wild tonnage of vessel companies interested only in transportation is now handling grain. The Struthers company has succeeded in securing several lots aggregating 100,000 tons and expects to line up enough ore to carry it through the spring. Heavy ore shipments in October brought the total movement for the season ahead of the corresponding period last year. Water shipments during October were 8,453,952 tons, an increase of 1,731,195 tons over the corresponding period last year. The total movement by water until Nov. 1 was 49,719,931 tons, a gain of 613,217 tons over the same period last year.

**Fluorspar.**—The domestic fluorspar price, which developed a firmer tone previous to the 50 per cent advance in the duty on foreign fluorspar, has been definitely established at \$18 a ton for gravel material, or \$1 a ton advance. One 500-ton lot and several small lots have been sold at the advance. Producers have not yet announced their price for next year.

**Coke.**—Some of the makers of premium grades of Connellsville foundry coke have opened their books for the first half at present prices and have

## Cleveland

### Steel Demand From Automobile Industry Takes a Spurt—Pig Iron Advanced 50c. by Lake Furnaces

CLEVELAND, Nov. 5.—The demand for finished steel continues fairly heavy. Specifications received by some of the mills which experienced a lull during part of October showed a gain the past week. The automotive industry is taking a heavy tonnage of steel bars and is crowding the mills for delivery. The demand for structural shapes is well sustained, but plates are only moderately active. Demand from the automotive industry, which has shown some seasonal decline, has taken a spurt with the release of specifications from the Chevrolet Motor Car Co. for steel for 125,000 cars for its new models, the production of which it will start shortly. The quantity released in sheets and strip steel is estimated at 25,000 to 30,000 tons.

New inquiry in the building field is not as active as recently. Considerable repair work is in prospect in the Lake shipbuilding industry, but, with the exception of two car ferries, no new boats are in prospect.

The market has a firm tone. Steel bars are holding to 1.95c., Pittsburgh, and to 1.90c. to 2.05c., Cleveland. Plates and structural shapes range from 1.90c. to 1.95c., Pittsburgh. Cold-rolled strip appears to have been definitely established at 2.85c., Cleveland and Pittsburgh.

The pig iron buying movement for the first quarter has increased in volume and another price advance of 50c. a ton has been made on foundry and malleable grades by Lake district furnaces.

**Pig Iron.**—Buying has increased in volume and a further price advance of 50c. a ton on foundry and malleable grades has been made by Cleveland and other Lake furnaces. The advance does not appear to check buying, as producers report sales at the new prices. Prices now are \$2 to \$2.50 a ton higher than those prevailing in the summer, when foundries

covered for the last half. An Ohio steel maker has purchased 15,000 tons of basic iron at \$17.50, furnace. This will be shipped from the same producing point to the same consuming point as a 10,000-ton lot, the sale of which at the same price, was reported a week ago. The freight rate is \$1.65, compared with a \$1.26 Valley rate, making the price equivalent to \$17.89, Valley furnace. Sales of foundry and malleable iron by Cleveland interests totaled 69,000 tons the past week. While most of the iron was for the first quarter, there were quite a few prompt shipment orders. Cleveland furnaces now quote foundry and malleable iron at \$18.50 for outside shipment and at \$19, furnace, for local delivery. Other Lake furnaces serving central and western Ohio and Indiana quote \$19. In Michigan, there is a price range of from \$19.50 to \$20. Some of the Valley furnaces have marked up their price to \$18 for foundry and to \$18.50 for malleable. Low phosphorus iron has not yet moved up with other grades, some small-lot business having been taken at \$26.50. Shipments continue heavy,

#### Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struct. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex.	3.65c.
Cold-fin. flats and sq.	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	5.95c.
Black sheets (No. 24)	3.50c.
Galvanized sheets (No. 24)	4.25c.
Blue ann'l'd sheets (No. 10)	3.35c.
No. 9 ann'l'd wire, per 100 lb.	32.85
No. 9 gal. wire, per 100 lb.	3.30
Com. wire nails, base per keg	2.85

\*Net base, including boxing and cutting to length.

taken a few contracts. Foundries are running well in this territory. Specifications are good, although there is not much new business. Prices are unchanged. Ohio by-product foundry coke is quoted at \$7.75, Painesville.

**Bolts, Nuts and Rivets.**—The volume of bolt and nut business in October showed a gain of from 5 per cent to 10 per cent over that of the previous month, and business in November has started out well. Orders are good from the automotive industry, and makers report a steady demand from the railroads. Rivet business also shows quite an improvement; a leading local manufacturer reports that its October volume was the best of any month this year.

**Sheets.**—While new business fell off in this territory the past week, mills are getting heavy specifications from the automotive industry and tonnage entered is holding up to shipments. Buyers are experiencing difficulties in finding mills that can make shipments as soon as desired, as the best deliveries are two weeks on galvanized and three to five weeks on other grades. The market generally has a firm tone, although price cutting has not entirely disappeared.

**Strip Steel.**—Specifications are heavy for both hot and cold-rolled strip. Some hot-strip business in small lots has been taken at the new prices and based on the new card of extras. Two producers of cold-rolled strip in this territory have followed other mills in marking up their price to 2.85c., Pittsburgh and Cleveland, which is now generally in effect. Consumers covered heavily before the advance.

**Semi-Finished Steel.**—Some small-lot inquiries are coming out, but a local producer is unable to quote on these, being sold up for the remainder of the year. Sheet bar consumers are pressing for deliveries.

**Reinforcing Bars.**—A \$2 a ton price advance on rail steel bars to 1.95c., mill, has been made by a western Pennsylvania mill. It is stated that the advance has been necessitated by a \$4 a ton increase in the price of rerolling rails. New billet steel bars are still available at 1.85c., Cleve-

land. Inquiry is confined to small lots.

**Wire Products.**—Nails show a firmer tone, although occasional shading is reported. The demand is moderate. Wire is active and firm.

**Old Material.**—Indications of an easier tone, which appeared more than a week ago, have become more pronounced, and prices have declined 50c. to 75c. a ton in some sections. The weakness is mostly on steel making grades. Locally, the weakening effect so far has been only sentimental, as prices here had not advanced to the extent that they did in the Pittsburgh and Youngstown districts. The demand is less active than it was, as some of the mills are now regulating shipments, and brokers are being offered more scrap than they need. In spite of the easier situation on other grades, blast furnace scrap has strengthened in the Cleveland market, selling as high as \$11.50 to dealers. In the Valley district, \$17.50 seems to have become the ruling mill price for No. 1 heavy melting steel, but dealers are offering only \$16.75 to \$17 for Youngstown delivery. In Detroit, dealers are offering 50c. to 75c. a ton less for scrap than a few days ago.

*Prices per gross ton delivered consumers' yards:*

Basic Open-Hearth Grades	
No. 1 heavy melting steel.....	\$14.50 to \$15.00
No. 2 heavy melting steel.....	14.00 to 14.50
Compressed sheet steel.....	14.00 to 14.50
Light bundled sheet stamp'gs.....	12.00 to 12.50
Drop forge flashings.....	12.25 to 12.75
Machine shop turnings.....	9.50 to 10.00
No. 1 railroad wrought.....	12.75 to 13.00
No. 2 railroad wrought.....	14.50 to 15.00
No. 1 busheling.....	13.00 to 13.50
Pipes and flues.....	9.00 to 9.50
Steel axle turnings.....	12.50 to 13.00
Acid Open-Hearth Grades	
Low phos. forging crops.....	16.00 to 16.50
Low phos., billet, bloom and slab crops.....	17.00 to 17.50
Low phos. sheet bar crops.....	16.50 to 17.00
Low phos. plate scrap.....	15.50 to 16.00
Blast Furnace Grades	
Cast iron borings.....	11.00 to 11.50
Mixed bor'gs and short turn'gs.....	11.00 to 11.50
No. 2 busheling.....	11.00 to 11.50
Cupola Grades	
No. 1 cast.....	16.50 to 17.00
Railroad grate bars.....	11.00 to 12.00
Stove plate.....	12.00 to 12.50
Rails under 3 ft.....	16.75 to 17.25
Miscellaneous	
Railroad malleable.....	16.00 to 16.50
Rails for rolling.....	16.25 to 16.50

this quarter and at \$20.50 per ton for next quarter, prior to the advance, but sellers did not, in most cases, offer the usual opportunity to consumers to cover at the old price. At present, buying is small, but the principal consumers are said to be showing more interest in covering for the first quarter. Basic iron is strong, eastern Pennsylvania furnaces quoting on a basis of \$19.50 per ton, furnace. About 20,000 tons of basic for a Coatesville, Pa., consumer has not yet been closed. Demand for low phosphorus continues good, sellers reporting active buying by wire rod producers and manufacturers of rolls. The New York State producer of low phosphorus iron reports its stocks considerably reduced, but does not expect to blow in its furnace until next year.

*Prices per gross ton at Philadelphia:*

East. Pa. No. 2, 1.75 to 2.25 sil.....	\$20.76 to \$21.76
East. Pa. No. 2X, 2.25 to 2.75 sil.....	21.26 to 22.26
East. Pa. No. 1X.....	21.76 to 22.76
Basic (del'd east. Pa.).....	19.75 to 20.00
Gray forge.....	20.00 to 20.50
Malleable.....	21.25 to 21.75
Stand. low phos. (f.o.b. N. Y. State furnace).....	22.00 to 23.00
Cop. b'r'g low phos. (f.o.b. furnace).....	23.00 to 23.50
Va. No. 2 plain, 1.75 to 2.25 sil.....	24.54
Va. No. 2X, 2.25 to 2.75 sil.....	25.04

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

**Bars.**—New business is small, but most mills are engaged in filling a good backlog of orders. Prices are being maintained at 2c., Pittsburgh, or 2.32c., Philadelphia, except for occasional transactions at \$1 a ton less to preferred buyers.

**Shapes.**—Prices are fairly steady at 2.05c., f.o.b. nearest mill to consumer, or 2.11c., Philadelphia, using Pencoyd, Pa., as a basing point for this district. Deliveries range from a week on certain sizes to three weeks on others. Mills are quoting on sizable tonnages of shapes for fabricators and shipbuilders.

**Plates.**—Quotations on new business are unchanged at 2.05c. to 2.15c., Coatesville, or 2.37c. to 2.47c., Philadelphia, the higher price for small

## Philadelphia

### Pig Iron Advanced 50c. a Ton—Scrap Prices Decline—Easier Tone in Steel Market

PHILADELPHIA, Nov. 5.—A decrease in the volume of new steel business is evident. Mills continue a good rate of operation, but deliveries are less extended on most products.

Foundry iron prices have been advanced by eastern Pennsylvania furnaces to \$20.50, furnace, for the rest of this year and to \$21, furnace, for first quarter delivery. Iron and steel scrap is decidedly weaker, recent sales showing reductions in price of about 50c. a ton, and sellers are freely offering to sell other grades at lower levels.

**Ferromanganese.**—Large consumers are not all covered for next year. Contracting for British ferromanganese is reported to have been rather small. For delivery throughout 1929, the quotation is \$105 per ton, seaboard.

**Pig Iron.**—Eastern Pennsylvania furnaces have advanced foundry iron to \$20.50 per ton for delivery to the end of this year and to \$21 per ton, base, for first quarter contracts. Some tonnage was closed at \$20 per ton for

### Warehouse Prices, f.o.b. Philadelphia

Base per Lb.	
Plates, ¼-in. and heavier.....	2.70c.
Plates, ⅜-in.....	2.90c.
Structural shapes.....	2.70c.
Soft steel bars, small shapes, iron bars (except bands).....	2.80c.
Round-edge iron.....	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.....	3.50c.
Round-edge steel, planished.....	4.30c.
Reinforc. steel bars, sq. twisted and deform.....	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.....	3.45c.
Cold-fin. steel, sq. and flats.....	3.95c.
Steel hoops.....	3.60c.
Steel bands, No. 12 to ⅝-in., inclus.....	3.35c.
Spring steel.....	5.00c.
*Black sheets (No. 24).....	3.85c.
†Galvanized sheets (No. 24).....	4.60c.
Blue ann'l'd sheets (No. 10).....	3.00c.
Diam. pat. floor plates—	
¼-in.....	5.30c.
⅝-in.....	5.50c.
Rails.....	3.20c.
Swedish iron bars.....	6.60c.

\*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.  
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.



lots. Deliveries range from about 10 days to three weeks. Bids for the building of four vessels, requiring 13,500 tons of plates, for the Export Steamship Co., New York, were opened today. The Department of Water Supply, Philadelphia, opens bids this week on a fabricated pipe line at Lardner's Point, for which about 9000 tons of plates will be required. Diamond pattern floor plates have been advanced \$2 a ton to 3.65c. per lb., Pittsburgh.

**Sheets.**—Occasional concessions of \$1 a ton from 2.75c., Pittsburgh, on black sheets continue to be reported, but the market on galvanized is firm at 3.50c., Pittsburgh, or 3.82c., Philadelphia. Blue annealed sheets are unchanged at 2c. and 2.10c., Pittsburgh, or 2.32c. and 2.42c., Philadelphia. There are reports of business taken at less than 2c., Pittsburgh, for blue annealed sheets narrower than 45 in., but sheet producers believe that these refer to sales of continuous mill sheets. Local consumers are specifying freely on their contracts and buying some additional tonnage.

**Warehouse Business.**—With some jobbers, October was the best month of the year and in most cases it is reported as considerably ahead of September. This month shows a continuation of active buying, and prices are being maintained with less shading than usual.

**Imports.**—In the week ended Nov. 3, 6935 tons of iron ore arrived at this port, of which 6700 tons was from Algeria and 235 tons from Spain. A total of 612 tons of chrome ore arrived from Portuguese Africa. Pig iron imports were 2100 tons from the United Kingdom and 152 tons from the Netherlands. Steel arrivals were as follows: From Sweden, 31 tons of steel billets and 42 tons of steel bars; from the United Kingdom, 15 tons of steel hoops, 8 tons of strip steel and 15 tons of steel scrap; from Germany,

57 tons of structural shapes, 16 tons of steel bars and 10 tons of steel scrap; from France, 10 tons of structural shapes and 501 tons of skelp.

**Old Material.**—Based on recent sales and the prices at which dealers are freely offering to sell most grades of scrap, the market is off about 50c. a ton. It is generally conceded that the maximum price of No. 1 heavy melting steel today is \$16 per ton, delivered, and a small tonnage has been sold to an eastern Pennsylvania mill at \$15.50. No. 2 grade has been bought by a Harrisburg consumer at \$12.50 per ton, delivered, and by a Pottsville, Pa., mill at \$12.75, delivered. Heavy breakable cast has declined to \$16 per ton on a recent sale to a Pottsville, Pa., consumer. One broker has sold 1000 tons of cast iron carwheels at \$16.50 per ton, delivered. Although transactions are not reported in other grades, brokers are offering to accept orders at about 50c. a ton less than the recent price peak.

*Prices per gross ton delivered consumers' yards, Philadelphia district:*

No. 1 heavy melting steel.	\$15.50 to \$16.00
Scrap T rails.	15.00 to 15.50
No. 2 heavy melting steel.	12.50 to 12.75
No. 1 railroad wrought.	16.00 to 16.50
Bundled sheets (for steel works)	11.50
Machine shop turnings (for steel works)	11.50
Heavy axle turnings (or equiv.)	12.50
Cast borings (for steel works and roll. mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	16.00 to 16.50
Railroad grate bars.	12.50 to 13.00
Stove plate (for steel works)	12.50 to 13.00
No. 1 low phos., hvy., 0.04% and under.	19.00 to 20.00
Couplers and knuckles.	17.50 to 18.00
Rolled steel wheels.	17.00 to 17.50
No. 1 blast furnace scrap.	10.00 to 11.00
Wrought iron and soft steel pipes and tubes (new specific.)	15.00 to 15.50
Shafting	19.00 to 20.00
Steel axles	22.00
No. 1 forge fire.	12.50 to 13.00
Cast iron carwheels.	16.50
No. 1 cast.	16.75 to 17.00
Cast borings (for chem. plant)	15.00 to 15.50
Steel rails for rolling.	15.50 to 16.00

above last year's 93,949 tons. A decline of 14 per cent in shipments from India and almost complete stoppage of those from Germany have been more than offset by an increase of over 24,000 tons coming from the United Kingdom, which holds first position this year, against third position last year.

## Automobile Output Passes 4,068,000 in 10 Months

Production of cars and trucks during the first 10 months this year reached 4,068,727, surpassing all previous marks for a corresponding period, according to reports to the National Automobile Chamber of Commerce. The previous high mark for the first 10 months was in 1926, when 4,062,110 cars and trucks were turned out.

October output was estimated at 397,000 motor vehicles, compared with 434,915 in September, and 227,510 in October last year. October was 75 per cent greater than October, 1927, but 8 per cent under September, this year.

Reports indicated that more than 800,000 American cars and trucks would be sold outside of the United States this year. During the first nine months more than 627,000 vehicles were shipped to 107 countries. This foreign demand exceeds last year's high mark of 643,634 vehicles.

Spanish-English editions of standard specifications of the American Society for Testing Materials, published by the Superintendent of Documents, Government Printing Office, Washington, for sale at 5c. per copy, have now appeared for carbon steel and alloy steel axles and other forgings for railroad use and for welded and seamless steel pipe.

Van Norman Machine Tool Co., Springfield, Mass., on Oct. 1 took over the sale of its products for garage and automotive trade, such as valve grinders, etc., which have been marketed through the Van Dorn Electric Tool Co., Cleveland. The Van Norman company will also market electric tools made by Stanley Rule & Level Division, Stanley Works, New Britain, Conn., including electric drills and other small tools, to automobile and garage trade. Distribution will be through jobbers. Leo F. Hunderup has been appointed sales manager.

## Decline in Pig Iron Imports in September

Imports of pig iron in September are reported by the Department of Commerce at 10,437 gross tons. This is a reduction of 20 per cent from the August incoming movement of 12,990 tons, but is much higher than the 6055 tons for July. A marked change has taken place in the origin of pig iron, compared with August. The

Netherlands supplied 40 per cent of the September total, followed by British India with 36 per cent and the United Kingdom in third position. In the preceding month British India supplied almost 60 per cent and shipments from the Netherlands were below those from Great Britain. Imports in September almost balanced the exports of 10,228 tons.

For the first nine months the total of 104,777 tons is about 11 per cent

UNITED STATES IMPORTS OF PIG IRON BY COUNTRIES OF SHIPMENT  
(In Gross Tons)

	September		Nine Months Ended September	
	1928	1927	1928	1927
United Kingdom	2,225	90	39,552	15,025
British India	3,758	6,242	38,027	44,142
Germany	500	500	95	8,871
Netherlands	4,159	1,319	21,832	20,787
Canada			378	689
France		1,000	300	2,500
Belgium			202	699
Norway	263		675	
All others	32	18	3,716	1,236
Total	10,437	9,169	104,777	93,949

A new Prest-O-Lite gas plant has commenced operations in Birmingham, Ala., to supply the local demand for dissolved acetylene used in oxy-acetylene welding and cutting. With this addition, the Prest-O-Lite chain now numbers 34 acetylene producing plants situated in industrial centers throughout the country.

## Pacific Coast

### Oil Storage Tanks Take Upward of 4000 Tons of Plates— Steel Demand Less Active

SAN FRANCISCO, Nov. 3 (*By Air Mail*).—Featuring the Pacific Coast iron and steel markets this week was the award of a number of oil storage tanks, calling for more than 4000 tons of plates, to the Western Pipe & Steel Co. Demand, generally, is by no means active.

**Pig Iron.**—This market is quiet. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	.....	\$25.00 to \$26.00
*Utah rdy., sil.	2.75 to	
3.25	.....	25.00 to 26.00
**Indian rdy., sil.	2.75 to	
3.25	.....	24.00 to 25.00

\*Delivered San Francisco.

\*\*Duty paid, f.o.b. cars San Francisco.

**Bars.**—The only award in excess of 100 tons this week called for 350 tons for highway work in Ventura County, and was placed with S. Pearson of Santa Monica, Cal. Inquiries include 188 tons for a bridge near Benham, Cal.; 129 tons for a bridge in Orange County, Cal., and 114 tons for a bridge near Wolf Point, Mont., across the Missouri River. Quotations on out-of-stock material, both in Los Angeles and San Francisco, are about 1.80c., base. On merchant bar steel, 2.35c., c.i.f., appears firm both at San Francisco and Los Angeles.

**Plates.**—Improvement in demand for plates is noted. Outstanding awards were 1800 tons for six 118,000-bbl. tanks for the Texas Co., Los Angeles; 1650 tons for three 170,000-bbl. tanks for the Wilshire Oil Co., and 565 tons for one 80,000 and three 10,000-bbl. tanks for the Hancock Oil Co., Los Angeles, all placed with the Western Pipe & Steel Co. Opening of bids on 231 tons of 24-in. riveted pipe for Seattle has been postponed until Nov. 2. Bids were opened this week on 185 tons of 20-in. shore pipe for the United States Engineer Office, San Francisco. Prices continue to range from 2.20c. to 2.25c., c.i.f. Coast ports.

**Shapes.**—Only one award exceeding 100 tons was reported in the week. This was 175 tons for a telephone building at San Bernardino, Cal., and was booked by the Union Iron Works. An award is expected within a few days on 2300 tons for the Methodist Book Concern Building in San Francisco, on which the McClintic-Mar-

shall Co. is low. Inquiries of the week include 300 tons for two apartments on Broadway, San Francisco; 170 tons for a bridge near Benham, Cal., and 667 tons for a bridge over the Missouri River near Wolf Point, Mont. On the latter project, the Missouri River Valley Bridge & Iron Co. is low bidder. Plain domestic material continues firm at 2.35c., c.i.f.

**Cast Iron Pipe.**—H. E. Conner, Redwood City, Cal., took 144 tons of 4 and 6-in. Class B pipe for the improvement of E Street, Tulare, Cal. Bids on 1284 tons of 24-in. Class B pipe for Seattle were held over until Nov. 2. For this project alternate bids are also being taken on riveted steel pipe. Lewiston, Idaho, has opened bids on 109 tons of 2 to 8-in. Class B pipe.

**Steel Pipe.**—The Hancock Oil Co., Los Angeles, has awarded a contract for 10 miles of 4-in. and 10 miles of 6-in. line pipe, requiring about 800 tons, to Allen Brothers, Inc. Oil country goods continue to move well in the southern part of the State.

## St. Louis

### Pig Iron Sales of 45,000 Tons Include 33,000 Tons of Basic— Steel Demand Continues Active

ST. LOUIS, Nov. 5.—Heavy sales again featured the pig iron market, with the demand for basic in the lead. Of total sales of 45,000 tons by the St. Louis Gas & Coke Corporation, the basic total was 33,000 tons, divided into lots of 15,000 tons, 10,000 tons, 6000 tons and 2000 tons, the second and last-named orders for delivery this year, and the remainder for first quarter of next year. All of the basic sales were to melters in the St. Louis industrial district. Buying has been largely by makers of steel underframes for railroad cars. Of 11,450 tons of foundry iron, all for first quarter, 7800 tons was sold to radiator manufacturers in lots of 3500 tons, 3100 tons and 1200 tons, and 3650 tons in lots of 100 to 500 tons, much of which will go to stove manufacturers, who are enjoying an unexpectedly large reorder business. The local maker has advanced its price 50c. a ton to \$20 to \$20.50. The leading Southern maker sold 1000 tons, principally for prompt shipments, to stove manufacturers. Southern interests have not opened their books for first quarter.

Prices per gross ton at St. Louis:

No. 2 rdy., sil.	1.75 to 2.25, f.o.b.
Granite City, Ill.	.....\$20.00 to \$20.50
N'th'n No. 2 rdy., deliv'd St. Louis	21.66
Southern No. 2 rdy., deliv'd	20.67
Northern malleable, deliv'd	21.66
Northern basic, deliv'd	21.66

Freight rates: 81c. Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

**Coke.**—Shipments of domestic grades of coke have been heavy from by-product ovens to out-of-town dealers as a result of colder weather. Dealers in St. Louis, proper, however, continue to buy in small quantities, permitting the ovens to carry stocks for them. The heavier melt has brought increased buying of metallurgical grades.

**Rails and Track Supplies.**—The Missouri Pacific has issued an inquiry for 4,000,000 tie plates, 2,000,000 of which are to be copper bearing. Inquiries for rails for 1929 are expected to be issued shortly by the lines centering here.

**Finished Iron and Steel.**—October was a very satisfactory month, with bookings not quite so heavy as in September, although sufficiently large to insure 100 per cent operations, according to the Granite City Steel Co. The demand for all grades of sheets, including galvanized, black and blue annealed, continues unabated, with prices firmer than they have been for many months. The demand for plates in the district is not exceptionally heavy, although sufficient to operate this department of the Granite City Steel Co. almost at capacity. Warehouse business in October ran from 10 to 15 per cent ahead of the preceding month and October, 1927.

**Old Material.**—The market for old material continues strong. Although heavy melting and heavy shoveling steel are unchanged, other price advances are recorded. Miscellaneous standard-section rails, railroad springs, No. 1 busheling, cast iron borings, rails for rerolling and steel angle bars are 25c. a ton higher, while No. 1 railroad wrought is up 50c. a ton. Wrought iron bars and transoms, in which there has been no activity until this week, jumped \$1.75 a ton, and railroad malleable advanced \$1. The fact that large car orders are expected in the district has added

### Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.95c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.15c.
Galv. corrug. sheets	5.00c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-press. nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-press. nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

### Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, 7/8-in. and over	3.15c.
Small angles, under 7/8-in.	3.55c.
Small channels and tees, 3/4-in. to 2 1/4-in.	3.75c.
Spring steel, 1/4-in. and thicker	5.00c.
Black sheets (No. 24)	5.00c.
Blue ann'l'd sheets (No. 10)	4.00c.
Galv. sheets (No. 24)	5.40c.
Struc. rivets, 1/2-in. and larger	5.65c.
Com. wire nails, base per keg	\$3.40
Cement c't'd nails, 100 lb. keg	3.40



considerable to the strength of the market. Shipments of old material from the country are increasing. Railroad lists include: Pennsylvania Lines, 50,830 tons; Baltimore & Ohio, 9819 tons; St. Louis-San Francisco, 14 carloads.

Dealers' buying prices, per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel	\$13.25 to \$13.75
No. 2 heavy melting or shoveling steel	12.25 to 12.75
No. 1 locomotive tires	14.50 to 15.00
Miscel. stand-sec. rails including frogs, switches and guards, cut apart	14.75 to 15.25
Railroad springs	15.75 to 16.25
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought	13.25 to 13.75
No. 1 bushing	9.50 to 9.75
Cast iron borings	8.75 to 9.25
Iron rails	13.00 to 13.50
Rails for rolling	15.25 to 15.75
Machine shop turnings	9.00 to 9.50
Steel car axles	18.50 to 19.00
Iron car axles	27.00 to 27.50
Wrot. iron bars and trans.	22.00 to 22.50
No. 1 railroad wrought	12.00 to 12.50
Steel rails, less than 3 ft.	17.00 to 17.50
Steel angle bars	14.25 to 14.75
Cast iron carwheels	13.75 to 14.25
No. 1 machinery cast	15.00 to 15.50
Railroad malleable	14.75 to 15.00
No. 1 railroad cast	14.00 to 14.50
Stove plate	12.50 to 13.00
Agricult. malleable	11.50 to 12.00
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

## Detroit

### Automobile Production Ahead of a Year Ago

DETROIT, Nov. 5.—Automobile production for October, estimated at 397,000 units, is approximately an 8 per cent decline from the production of the previous month, and is reflected in the employment barometer of the Employers' Association of Detroit, which has shown a total decrease of 11,600 during October. A total of 285,936 individuals on the combined payrolls of representative firms employing two-thirds of the city's industrial population is 3648 less than that of the week previous, but is 93,525 ahead of the same period a year ago.

The Ford Motor Co. has in the past week surpassed all employment records, with a total of 186,313 individuals on the payroll. The two large local plants are now employing 125,000 men. The production rate on the model A cars has reached 6000 daily, with a total of 615,000 units of that line in service. A special body style is being planned by the Ford company, which will be priced about \$100 higher than the regular line. Production on the deluxe model will be begun about the first of the year.

The Willys-Overland Co. has reduced its production, and is preparing to get under way on the new Whippet model before the first of the year.

An increase of about 50 per cent is being planned for the plant of the Wire Wheel Corporation of America, which is now turning out about 52,000 wheels a month.

The J. W. Brown Mfg. Co., now working on 10-hr. shift, expects to add a night shift in the next three weeks. This company has received a large order from the Ford Motor Co.

In the structural market, firmness

of structural shapes, bars and plates has succeeded in bringing out a substantial amount of industrial work in small jobs. Speed of erection is an important factor, and the number of bidders on any one job is inclined to be low. The small shops for the past six or eight weeks have been busy and

at the present time have approximately three weeks' work ahead. The large shops are practically filled up for the remainder of the year.

Bids are being taken on the National City Bank of Battle Creek, which will include about 400 tons of structural steel.

## Boston

### Price Advance by Buffalo Furnaces Not Fully Established by Sales of the Week

BOSTON, Nov. 6.—The recent advance to \$17.50, base furnace, on Buffalo pig iron has not been adhered to in all of the transactions of the past week. The new prices are being obtained in some instances, however. Buffalo furnaces have solicited car lots at \$17 per ton, furnace base, and furnaces east of Buffalo have made cuts on sizable tonnages. A furnace took 1000 tons of No. 2X iron at less than \$22 a ton, delivered, the actual figure being at or close to \$21.50, according to the purchaser. About two-thirds of the 8000 tons sold by furnace representatives here the past week is to be delivered this year, the rest early in 1929. Sales included 1000 tons of No. 2X to a Massachusetts foundry, 1000 tons No. 2X and No. 1X to another New England consumer, 1000 tons No. 2 plain and No. 2X to a New Jersey melter and many smaller tonnages.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25..	\$22.41
*Buffalo, sil. 2.25 to 2.75..	22.91
†Buffalo, sil. 1.75 to 2.25..	21.28
†Buffalo, sil. 2.25 to 2.75..	21.78
East. Penn., sil. 1.75 to 2.25	23.65
East. Penn., sil. 2.25 to 2.75	24.15
Va., sil. 1.75 to 2.25.....	26.91
Va., sil. 2.25 to 2.75.....	27.41
Ala., sil. 1.75 to 2.25.....	\$23.16 to 25.02
Ala., sil. 2.25 to 2.75.....	23.66 to 25.52

Freight rates: \$4.91 all rail and \$3.78 rail and water from Buffalo; \$3.65 from eastern Pennsylvania; \$5.21 all rail from Virginia; \$6.91 to \$8.77 from Alabama.  
\*All rail rate. †Rail and water rate.

### Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hex.	*3.55c. to 5.55c.
Squares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
Per Cent Off List	
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

\*Including quantity differentials.

Cast Iron Pipe.—Prices on small pipe have been advanced \$1.50 to \$2 a ton. For 4-in. stock, \$46.10 a ton, delivered common Boston freight rate points, is the prevailing price, and for 6 to 12-in. stock, \$41.10. The market for 16 in. and larger pipe is openly \$40.10 a ton, but concessions undoubtedly can be obtained on desirable tonnages. Salem, Mass., will close bids Nov. 6 on 100 tons of 6-in. pipe. Private business is exceptionally good for this time of the year.

Old Material.—Shipments of old material out of New England are holding up well, and there seems to be a somewhat better demand for machinery cast from New England foundries. Brokers report that material is coming out more freely, probably because of a feeling among owners that the advance in values has been checked. On the surface there appears to be a little easier market for heavy melting steel, yet all transactions reported in this territory the past week have continued within a range of \$11.50 to \$12 a ton, on cars, shipping point. The export market is at a standstill, presumably because of the inability of shippers to secure vessel space at desired rates.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	\$11.50 to \$12.00
Scrap T rails	11.00 to 11.50
Scrap girder rails	10.50 to 11.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	9.50 to 10.00
Machine shop turnings	7.00 to 7.50

Cast iron borings (steel works and rolling mill)	6.25 to 6.60
Bundled skeleton, long	9.00 to 9.50
Forge flashings	9.50 to 10.00
Blast furnace borings and turnings	6.25 to 6.60
Forged scrap	7.00 to 7.50
Shafting	14.50 to 15.00
Steel car axles	16.50 to 16.75

Wrought pipe 1 in. in diameter (over 2 ft. long)	10.00 to 10.50
Rails for rolling	11.00 to 11.50
Cast iron borings, chemical	10.00 to 10.25

Prices per gross ton deliv'd consumers' yards:

Textile cast	\$14.00 to \$14.50
No. 1 machinery cast	15.50 to 16.00
No. 2 machinery cast	13.50 to 14.00
Stove plate	11.00 to 11.50
Railroad malleable	15.00 to 15.50

Coke.—The New England Coal & Coke Co., Boston, and the Providence Gas Co., Providence, R. I., have announced that no change will be made in the contract price of foundry coke of \$11 a ton, delivered within a \$3.10 freight rate zone. That price has

been in effect for at least six months. Both companies have opened their books for first half contracts.

**Fabricated Steel.**—Bids have been asked on 4000 tons of fabricated steel for the United Shoe Machinery Cor-

poration's Boston office building. In addition, there are many small inquiries. Fabricators, however, are sadly in need of tonnages, and some low prices are being made even on small jobs.

## Birmingham

### Heavy Demand for Finished Steel Continues But Pig Iron Buying Is Light

BIRMINGHAM, Nov. 5.—The pig iron market has been unusually quiet in the past two weeks, only a few small-lot sales being reported. Nearly all melters are covered for the year and they have shown little interest in first quarter iron. Shipments are slightly greater than production. The base price remains at \$16.25 for deliveries during November and December. The Tennessee company has changed its Ensley No. 2 and 4 furnaces from foundry to basic iron. The No. 2 furnace of the Republic Iron & Steel Co., blown out last June for relining, is now ready for operating. Eighteen furnaces are in blast, of which 13 are on foundry, four on basic and one on ferromanganese.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.....	\$16.25
No. 1 fdy., 2.25 to 2.75 sil.....	16.75
Basic .....	16.25

**Finished Steel.**—No evidence appears of a letup in the heavy buying of the past several weeks. Bars, plates and shapes are doing better than at any time in the past several seasons. Mills are adhering closely to quotations. Rail inquiries are increasing, and the Tennessee company is expected to announce the reopening of its Ensley rail mill by the middle of this month. Structural steel lettings have been light during the week, but some good tonnages are up for figures. Reinforcing bar manufacturers are securing enough tonnage in small orders to maintain backlogs. Structural plate works report a good run of inquiries. The Tennessee company is now operating five open-hearths at Ensley, an increase of two during the

week. Seven remain in operation at Fairfield, and the Gulf States Steel Co. is working four at Alabama City.

**Cast Iron Pipe.**—The market is quieter than it has been in some time. Recent inquiries have involved small tonnages. Plants are operating at 60 to 70 per cent of capacity, and even at this rate backlogs are being reduced considerably. Makers are holding closely to the quotations of \$36 to \$37 on 6-in. and larger sizes, and it is reported that an advance of \$1 a ton on the smaller orders will be made shortly.

**Coke.**—New sales continue light. Most foundries are well covered through the first quarter. The Woodward Iron Co. placed 22 additional ovens in operation last week and is now operating 222 of its 230 ovens. Other operations in the district are the same. Prices are unchanged, quotations being \$5 for both spot and foundry coke.

**Old Material.**—A gradual easing up in the market has developed during the past two weeks. Orders are lighter. No price changes have been made. There has been a decided drop in shipments during the last 10 days.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel.....	\$12.50
Scrap steel rails.....	\$12.00 to 12.50
Short shovelling turnings..	8.00 to 8.50
Cast iron borings.....	8.00
Stove plate .....	13.50
Steel axles .....	19.00 to 20.00
Iron axles .....	21.00 to 22.00
No. 1 railroad wrought...	10.00 to 10.50
Rails for rolling.....	14.00 to 15.00
No. 1 cast.....	15.00
Tramcar wheels .....	13.00 to 14.00
Cast iron carwheels.....	13.00 to 13.50
Cast iron borings, chem...	13.50 to 14.00

## Buffalo

### Pig Iron Buying at New Prices Emphasizes Strength of Market—Steel Mills Continue High Operations

BUFFALO, Nov. 7.—Buying of pig iron at the new prices has not been heavy, but it has been in sufficient volume to indicate that the new prices

are firm. Furnace stocks are low and shipments against old orders are steady. The melt is apparently heavy. A sizable amount of buying for the first quarter has been done, but considerable requirements are not covered. Inquiry includes several lots, both malleable and foundry, up to 500 and 1000 tons. A fair volume of recent business at the new prices is for delivery in this last quarter, but some will run into the first quarter. An indication of the strength of the market is that a lot of 5000 to 10,000 tons of foundry purchased in this dis-

trict by an outside speculative interest has been taken by a furnace.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25..	\$17.50 to \$18.50
No. 2X fdy., sil. 2.25 to 2.75	18.00 to 19.00
No. 1X fdy., sil. 2.75 to 3.25	19.00 to 20.00
Malleable sil. up to 2.25..	18.00 to 19.00
Basic .....	17.50 to 18.00
Lake Superior charcoal...	27.28

**Finished Iron and Steel.**—The operation of local mills continues at top notch. Capacity of all of them is being pushed to get out tonnage. Prices of bars, plates, shapes and sheets continue firm. Wire demand is strong, though seasonal products like road building mesh, etc., show a decline. Reinforcing bar demand is fair, and the price firm at 2.515c., warehouse. The Teachers' College job at Buffalo will require about 300 tons of reinforcing steel. A large volume of metal lath is being sold.

**Old Material.**—After a slight reactionary tendency caused principally by the action of a large consumer in regulating shipments, the market has again developed strength. The regulatory order is still in effect, but is not quite so rigidly enforced. The strength of the local market is being maintained in part by a heavy demand from outside districts. The Youngstown district is taking heavy shipments of No. 1 heavy melting steel, No. 2 heavy melting steel and hydraulic compressed sheets, while turnings and borings are being sent into Pittsburgh district from Buffalo. The stove plate market has dropped off somewhat, as the principal consumer is out of the market, possibly for the rest of the year. Some small sales of knuckles and couplers and rolled steel wheels have been made at \$17.50.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel..	\$15.75 to \$17.00
No. 2 heavy melting steel..	14.25
Scrap rails .....	15.50 to 16.00
Hydraulic comp. sheets....	14.25
Hand bundled sheets.....	12.00 to 12.50
Drop forge flashings.....	13.50 to 14.00
No. 1 bushelling .....	14.75 to 16.00
Hvy. steel axle turnings....	13.50 to 14.00
Machine shop turnings....	8.00 to 8.50
No. 1 railroad wrought....	14.50 to 15.00

Acid Open-Hearth Grades	
Knuckles and couplers....	17.00 to 17.50
Coil and leaf springs.....	17.50 to 18.00
Rolled steel wheels.....	17.00 to 17.50
Low phos. billet and bloom ends .....	18.00 to 18.50

Electric Furnace Grades	
Short shov. steel turnings..	11.00 to 11.50

Blast Furnace Grades	
Short shov. steel turnings..	11.00 to 11.50
Short mixed borings and turnings .....	11.00 to 12.00
Cast iron borings .....	11.00 to 12.00
No. 2 bushelling .....	11.00 to 12.00

Rolling Mill Grades	
Steel car axles .....	18.75 to 19.25
Iron axles .....	21.00 to 22.00

Cupola Grades	
No. 1 machinery cast.....	15.50 to 16.00
Stove plate .....	14.50 to 14.75
Locomotive grate bars....	13.00 to 13.50
Steel rails, 3 ft. and under.	17.50 to 18.00
Cast iron carwheels .....	13.00 to 13.50

Malleable Grades	
Industrial .....	16.00 to 16.50
Railroad .....	16.00 to 16.50
Agricultural .....	16.00 to 16.50

#### Warehouse Prices, f.o.b. Buffalo

Base per Lb.	
Plates and struc. shapes.....	3.40c.
Soft steel bars.....	3.30c.
Reinforcing bars .....	2.75c.
Cold-fin. flats, sq. and hex.	4.45c.
Rounds .....	3.95c.
Cold rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.20c.
Galv. sheets (No. 24).....	4.85c.
Blue ann'l'd sheets (No. 10).....	3.50c.
Com. wire nails, base per keg.....	\$3.60
Black wire, base per 100 lb.....	3.75



## Cincinnati

### Pig Iron Users Showing More Interest in First Quarter— Steel Demand Has Eased Slightly

CINCINNATI, Nov. 5.—With prices showing a further tendency to advance, pig iron users are showing greater interest in anticipating first quarter needs. Sales the past week amounted to about 7000 tons, including 1500 tons of Jackson County silvery iron for a Michigan consumer and a like tonnage of foundry iron for a central Ohio melter. A local dealer booked an order for 1000 tons of low phosphorus iron for delivery to an Ohio customer. The chief inquiry is for 2500 tons of foundry iron for a Springfield, Ohio, company. Northern Ohio foundry iron has gone up another 50c. a ton and now is quoted at \$18.50, base furnace, while a Tennessee furnace, which has been taking first quarter business at \$16.25, base Birmingham, has withdrawn that quotation for delivery after Dec. 31. Southern makers are reported to be contemplating an increase of 75c. a ton for the first quarter, although no announcement of the new schedule is expected for a week or two. The only seller at Ironton, Ohio, with stock on its yards, is quoting \$18, base furnace.

Prices per gross ton, delivered Cincinnati:  
So. Ohio fdy., sil. 1.75 to 2.25.....\$19.89  
Ala. fdy., sil. 1.75 to 2.25..... 19.94  
Ala. fdy., sil. 2.25 to 2.75..... 20.44  
Tenn. fdy., sil. 1.75 to 2.25..... 19.94  
S'th'n Ohio silvery 8 per cent..... 26.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

**Finished Material.**—A slight curtailment of buying by steel consumers is seen, although the lull is regarded as temporary. District sheet mills report October bookings were in excess of capacity, but decreased specifications the past week have brought the unfilled tonnage down to a point almost identical with that of a month ago. Production continues at 100 per cent of capacity, with the present scale of operations assured for two weeks. The volume of business has been maintained at a high level. Prices are steady at 4c., base Pittsburgh, for automobile body stock; 2c. for blue annealed; 2.75c. for black, and 3.50c. for galvanized. Recent advances in primary materials, as well as the

strong position of producers, make likely an increase in first quarter sheet prices, according to district mills. Demand for wire goods is sluggish and common wire nails are unchanged at \$2.69 per keg, delivered Cincinnati. Bars, shapes and plates are moving fairly well at 1.95c. to 2c., base Pittsburgh. A nearby maker of rail steel reinforcing bars has increased prices \$1 a ton to a minimum of 1.90c., base mill.

**Coke.**—A considerably lessened demand for by-product foundry coke the past week suggests the possibility that shipments this month will fall well behind those in October. However, the increased movement of domestic grades is expected to offset partially the slump in foundry coke. By-product coke makers have announced an advance of 50c. and 25c. a ton in egg and walnut sizes respectively, the new schedule effective Nov. 1 being \$5, ovens, on egg and \$3.75 on walnut. Foundry coke is unchanged at \$7, ovens, or \$9.64, delivered Cin-

cinnati. Prices at Detroit also are undisturbed on both foundry and domestic grades.

**Old Material.**—Heavy melting steel is off 25c. a ton and scrap rails for melting have declined 50c., but other items are firm and unchanged. Since district mills are booking good orders and are likely to maintain operations at a satisfactory rate during the remainder of the year, dealers are not anticipating drastic shrinkage in prices. However, developments of the past week have made them more conservative in purchasing available material. Lists closing this week include the Norfolk & Western, 5000 tons, and Baltimore & Ohio, 9800 tons.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$13.25 to \$13.75
Scrap rails for melting....	13.50 to 14.00
Loose sheet clippings.....	9.50 to 10.00
Bundled sheets .....	10.25 to 10.75
Cast iron borings.....	9.75 to 10.25
Machine shop turnings....	9.25 to 9.75
No. 1 busheling.....	11.00 to 11.50
No. 2 busheling.....	6.50 to 7.00
Rails for rolling.....	14.00 to 14.50
No. 1 locomotive tires....	14.00 to 14.50
No. 2 railroad wrought....	13.50 to 14.00
Short rails .....	19.00 to 19.50
Cast iron carwheels.....	12.50 to 13.00
No. 1 machinery cast....	18.50 to 19.00
No. 1 railroad cast.....	14.75 to 15.25
Burnt cast .....	10.50 to 11.00
Stove plate .....	10.50 to 11.00
Brake shoes .....	10.25 to 10.75
Railroad malleable .....	13.50 to 14.00
Agricultural malleable ...	13.00 to 13.50

## Canada

### Dominion Iron and Steel Business Continues on High Level —Prospective Building Construction Large

TORONTO, ONT., Nov. 5.—Canadian business is on an exceptionally high level. Of 10 indicators reported by the Dominion Bureau of Statistics for September, every one exceeded the figure for the previous year and in two cases gains of 75 per cent or more were recorded. While the figures deal with many phases of business, the iron and steel industry easily leads. With 1927 figures equaling 100, business in the pig iron industry in Canada was at 175 for the first nine months of 1928, and steel was at 185 for the same period. Employment advanced to 109; car loadings to 119; building permits, 148; imports, 116; exports, 113; coke, 129; coal, 104.

An indication of Canadian agricultural prosperity has been the extensive purchasing of farm machinery. More business has been done in the farm implement trade in western Canada during 1928 than in any one of the past 15 years, and a further illustration of the increasing purchasing power of the farmer is that most of the transactions have been for cash.

**Pig Iron.**—Spot sales in October reached a new high record, and the demand is being carried into November. Forward buying was not large in October, although a few small contracts were closed. While some inquiry is coming out for forward delivery, the bulk of new business is for spot shipment. Spot sales hold to a weekly average of about 1200 tons. Some belated water shipments are being made, but as Lake navigation

nears its close such shipments are falling off. Prices remain firm.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$23.60
No. 2 fdy., sil. 1.75 to 2.25.....	23.60
Malleable .....	23.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.....	25.00
No. 2 fdy., sil. 1.75 to 2.25.....	25.00
Malleable .....	25.00
Basic .....	24.00
Imported Iron, Montreal Warehouse	
Summerlee .....	33.50
Carron .....	33.00

**Structural Steel.**—Current and prospective business is in large volume. It is estimated that approximately \$20,000,000 worth of structural steel work in Canada is pending. Included in this estimate are large buildings in eastern Canada and a good deal of bridge work for the railroads in western Canada and for the railroads and municipal governments in eastern Canada. Among pending awards are 500 tons for a new hotel at Orillia, Ont.; 350 tons for a garage at Bay and St. Albans Streets, Toronto, for Hyslop Brothers; 200 tons for plant addition for Hinde & Dauch Paper Co. of Canada, Toronto; 2000 tons for Hudson Bay Co. store at Calgary, Alta. Awards include: 100 tons to the Dominion Bridge Co. for club house on Pine Avenue, Montreal; 200 tons to the Sarnia Bridge Co. for General Hospital at Sarnia, Ont.; 150 tons to the Dominion Bridge Co., Redford Building, for addition to plant of Willys-Overland, Ltd., Toronto; 1500 tons to Manitoba Bridge & Iron

### Warehouse Prices, f.o.b. Cincinnati

Base per Lb.	
Plates and struc. shapes.....	3.40c.
Bars, soft steel or iron.....	3.30c.
New billet reinf. bars.....	3.15c.
Rail steel reinf. bars.....	3.00c.
Hoops .....	4.00c. to 4.25c.
Bands .....	3.95c.
Cold-fin. rounds and hex.....	3.85c.
Squares .....	4.35c.
Black sheets (No. 24).....	3.90c.
Galvanized sheets (No. 24).....	4.75c.
Blue ann'd sheets (No. 10).....	3.45c.
Structural rivets .....	3.85c.
Small rivets .....	.65 per cent off list
No. 9 ann'd wire, per 100 lb.....	\$3.00
Com. wire nails, base per keg.....	2.95
Cement c't'd nails, base 100 lb. keg.....	2.95
Chain, per 100 lb.....	7.55
Net per 100 Ft.	
Lap-weld. steel boiler tubes, 2-in.....	\$18.00
4-in.....	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.....	39.00

Works, Winnipeg, Man., for bridge at Miniota, Man., for the Canadian National Railways.

**Old Material.**—Hamilton and Toronto buyers continue to place good orders for heavy melting steel and turnings. Machinery cast, stove plate and malleable scrap are also moving freely to consumers throughout Ontario. Montreal dealers report a good demand for heavy melting steel, machinery cast, stove plate and wrought iron and steel axles.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel.....	\$9.50	\$7.00
Rails, scrap .....	10.00	9.00
No. 1 wrought .....	9.00	11.00
Machine shop turnings..	7.00	5.00
Boiler plate .....	7.00	6.00
Heavy axle turnings.....	7.50	6.50
Cast borings .....	7.50	5.00
Steel turnings .....	7.00	5.50
Wrought pipe .....	5.00	5.00
Steel axles .....	14.00	20.00
Axles, wrought iron.....	16.00	22.00
No. 1 machinery cast.....	16.00	16.00
Stove plate .....	13.00	13.00
Standard carwheels.....	16.00	16.00
Malleable .....	13.00	13.00
	Per Net Ton	
No. 1 machinery cast.....	15.00	....
Stove plate .....	9.00	....
Standard carwheels.....	13.00	....
Malleable scrap .....	13.00	....

## Detroit Scrap and Pig Iron Strong

DETROIT, Nov. 5.—Prices of old material in this district continue to show strength. Sales are usually on the high side of the range. Shipments of pig iron promise to keep on the heavy basis of last month. Pig iron prices for spot and first quarter delivery are firm at \$19.50 to \$20, base.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel .....	\$13.00 to \$13.50
Borings and short turnings .....	9.00 to 9.50
Long turnings .....	8.00 to 8.50
No. 1 machinery cast.....	14.00 to 15.00
Automobile cast .....	19.00 to 20.50
Hydraul. comp. sheets.....	12.25 to 12.75
Stove plate .....	11.00 to 12.00
No. 1 busheling .....	10.00 to 10.50
Sheet clippings .....	8.00 to 8.50
Flashings .....	10.75 to 11.25

## Pennsylvania Railroad to Electrify Its Lines

The Pennsylvania Railroad has announced that electrification of its entire service will be continued at a total cost of \$100,000,000. Approval of the plans by the board of directors was made public last week by W. W. Atterbury, president. The work of electrification will be spread over seven or eight years, and will be accomplished by sections.

At present the road is electrified from the Sunnyside yards, Long Island City, to Manhattan Transfer, and from Philadelphia to Wilmington. The latter section has just been completed. The next step will be the electrification of the line between Trenton, N. J., and Philadelphia, which will be completed about 1930. The Newark to New Brunswick section will then be done in about a year and a half, after which the New Brunswick to Trenton section will be undertaken. The next development

will be in and around Pittsburgh. Overhead construction will be used.

In five years the Pennsylvania will require between 250 and 300 electric locomotives. The Copper and Brass Research Association has estimated that the electrification project will call for about 55,000,000 lb. of copper.

## Texas and Pacific Buys Machine Tools

The Missouri-Kansas-Texas Railway has bought the following machine tools for use in its shops at Smithville, Tex.: Putnam heavy-duty, motor-driven axle lathe, Putnam 48-in., heavy-duty carwheel borer and Oster motor-driven pipe shearing and cutting machine from Manning, Maxwell & Moore, and a Cincinnati 42-in. vertical boring and turning mill, two United States 18-in., motor-driven floor grinders, Sidney 24-in. lathe and Sidney 18-in. lathe from Huey & Phillips Machinery Co., Dallas, Tex.

## Increase in Number of Steel Workers

Iron and steel plants to the number of 201 had 267,160 employees on the payroll in September, compared with 265,848 employees in the same plants in August. The increase was 1/2 per cent. There was, however, a reduction in the amount of payroll, which came to \$8,180,197 for one week in September, against \$8,296,664 for the corresponding week in August, a loss of 1.4 per cent.

Similarly, 981 identical plants turning out foundry and machine shop products showed 247,851 employees in September, a gain of 1.1 per cent over August, while the payroll for one week at \$7,346,854 in September showed a gain of 0.1 per cent over August. Machine tool plants to the number of 145 had 33,099 employees in September, a gain of 11.9 per cent over August. The payroll for one week in September was \$1,077,449, a gain of 12.4 per cent over August.

## Imports of Iron Ore Decline

September iron ore imports are reported by the Department of Commerce at 211,494 gross tons, compared with 225,538 tons in August, which was the highest total since last February. The September figures, except for August, are the largest since April,

but are below those of September, 1927, when 224,524 tons came in.

Imports in the first nine months were 9 per cent below those for last year. The total of 1,887,201 tons included considerably more than 1,000,000 tons from Chile, which country accounted for 56 per cent of the aggregate imports. French Africa and Cuba remain respectively in second and third positions. Imports coming from Sweden within the first nine months were only one-tenth as great as last year, due mainly to the strike in the Swedish mines.

## Railroad Equipment

### Wabash to Buy 2000 Automobile Cars

**I**NQUIRY from the Wabash for 2000 automobile cars was the outstanding development of the week. The Chicago & North Western has inquired for 325 freight cars in addition to the 400 last week and a Texas oil company expects to buy 200 tank cars. Details of the week's business follow:

Lehigh & New England is asking for bids on repairs to 200 50-ton gondola cars.

Richardson Refining Co., Fort Worth, Tex., expects to purchase 200 8000-gal. tank cars.

St. Louis-San Francisco has ordered underframes and parts for rebuilding 10 box cars from American Car & Foundry Co.

Rapid City, Black Hills & Western has ordered one 70-ton locomotive from Heisler Locomotive Works and is inquiring for three observation and two baggage and mail cars.

Central Railroad of New Jersey will rebuild 499 ice cars at its own shops.

Delaware, Lackawanna & Western has ordered two dining cars from Pullman Car & Mfg. Corporation.

New York, New Haven & Hartford is inquiring for 20 underframes for wood baggage cars.

Wabash Railway is in the market for 2000 automobile box cars.

Chicago, Rock Island & Pacific will buy five baggage cars.

Chicago & North Western will purchase 300 flat cars and 25 70-ton hopper cars.

In Germany there are 275 plants manufacturing agricultural machinery and employing 45,000 to 50,000 workers, as against 135, which employed about 25,000 workers in 1913, according to a report received by the Department of Commerce from Trade Commissioner James E. Wallis, Jr., Berlin.

SOURCES OF AMERICAN IMPORTS OF IRON ORE  
(In Gross Tons)

	September		Nine Months Ended September	
	1928	1927	1928	1927
Chile .....	130,800	131,000	1,079,100	1,044,600
Cuba .....	31,000	22,000	265,786	314,613
Spain .....	5,461	15,100	22,208	26,717
Sweden .....	.....	7,676	19,614	195,802
French Africa .....	27,525	31,849	362,130	370,822
Canada .....	167	1,962	45,359	16,235
Other countries .....	16,541	14,937	93,004	92,239
Total .....	211,494	224,524	1,887,201	2,061,028



# Non-Ferrous Metal Markets

## Copper Quiet and Firm, Tin Moderately Active and Steady, Lead and Zinc Without Change

NEW YORK, Nov. 5.

**Copper.**—Consumers have become decidedly less insistent in placing orders for copper and the runaway conditions, which were regarded as imminent a week ago, have given way to extreme quietness. Consumers both here and abroad have not bought much copper the past week. This has relieved the pressure on producers and left prices where they were. Electrolytic copper is firm at 16c., delivered in the Connecticut Valley, with the price to foreign consumers 16.25c., c.i.f. European ports, as the official quotation of Copper Exporters, Inc. Domestic consumers are fully covered for the rest of the year, and it is esti-

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY					
	Nov. 5	Nov. 3	Nov. 2	Nov. 1	Oct. 31
Lake copper, New York.....	16.12½	16.12½	16.12½	16.12½	16.25
Electrolytic copper, N. Y.*.....	15.75	15.75	15.75	15.75	15.75
Straits tin, spot, N. Y. ....	49.25	49.25	49.62½	49.75	49.37½
Lead, New York.....	6.50	6.50	6.50	6.50	6.50
Lead, St. Louis.....	6.32½	6.32½	6.32½	6.32½	6.32½
Zinc, New York.....	6.60	6.60	6.60	6.60	6.60
Zinc, St. Louis.....	6.25	6.25	6.25	6.25	6.25

\*Refinery quotation; delivered price ¼c. higher.

mated that they have purchased 80 to 90 per cent of their January requirements, with some February metal contracted for. Foreign consumers must still buy some metal for this year and considerable for January and February. The entire aspect of the market has changed, however, in that buying for at least three months ahead has taken the place of hand-to-mouth purchases. Producers have assured consumers that there is copper enough to go around and the fear of a scarcity has practically disappeared. The Lake copper market is also very quiet at 16c. to 16.12½c., delivered.

**Copper Averages.**—The average price of Lake copper for October, based on daily quotations in THE IRON AGE, was 15.50c. The average price of electrolytic copper was 15.16c., refinery, or 15.41c., delivered in the Connecticut Valley.

**Tin.**—In the week ended Saturday,

Nov. 3, about 1200 tons changed hands in a quiet market. The business was about equally divided between consumers and dealers. The two most active days were Oct. 30 and Nov. 1, when the sales on each day were about 400 tons. This year's delivery was principally involved, with far futures neglected. Considerable tin was declared for delivery on Nov. 1 against November contracts. Deliveries into consumption in October were 6475 tons, with 4598 tons in stock and landing on Oct. 31. The market today is very quiet, preceding election, with spot tin quoted at 49.25c., New York. Under continued speculative conditions in London, prices today were again higher, with spot standard quoted at £229 7s. 6d., future standard at £224 15s. and spot Straits at £229 7s. 6d. The Singapore price today was £224 10s.

**Lead.**—Substantial buying by nearly

### Metals from New York Warehouse

#### Delivered Prices Per Lb.

Tin, Straits pig.....	50.50c. to 51.50c.
Tin, bars.....	52.50c. to 53.50c.
Copper, Lake.....	17.00c.
Copper, electrolytic.....	16.75c.
Copper, casting.....	16.00c.
Zinc, slab.....	7.25c. to 7.75c.
Lead, American pig.....	7.50c. to 8.00c.
Lead, bar.....	9.25c. to 10.25c.
Antimony, Asiatic.....	12.50c. to 13.50c.
Aluminum No. 1 ingots for remelting (guar'nt'd over 99% pure).....	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy.....	24.00c. to 25.00c.
Babbitt metal, commerc'l grade.....	30.00c. to 40.00c.
Solder, ½ and ¼.....	32.50c. to 33.50c.

### Metals from Cleveland Warehouse

#### Delivered Prices Per Lb.

Tin, Straits pig.....	55.50c.
Tin, bar.....	57.50c.
Copper, Lake.....	17.00c.
Copper, electrolytic.....	17.00c.
Copper, casting.....	16.75c.
Zinc, slab.....	8.00c.
Lead, American pig.....	7.00c. to 7.25c.
Lead, bar.....	9.50c.
Antimony, Asiatic.....	16.00c.
Babbitt metal, medium grade.....	18.75c.
Babbitt metal, high grade.....	59.00c.
Solder, ½ and ¼.....	33.50c.

### Rolled Metals from New York or Cleveland Warehouse

#### Delivered Prices, Base Per Lb.

<b>Sheets—</b>	
High brass.....	20.25c.
Copper, hot rolled.....	25.00c.
Copper, cold rolled, 14 oz. and heavier.....	26.25c.
<b>Seamless Tubes—</b>	
Brass.....	25.12½c.
Copper.....	26.00c.
Brazed Brass Tubes.....	28.25c.
Brass Rods.....	18.00c.

#### From New York Warehouse

#### Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), cases.....	10.00c. to 10.50c.
Zinc sheets, open.....	11.00c. to 11.50c.

## Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products have not changed since the advances of Oct. 29. Zinc sheets are quoted at 9.75c., base, and lead full sheets at 10c. to 10.25c.

### List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

<b>Sheets—</b>	
High brass.....	20.50c.
Copper, hot rolled.....	25.00c.
Zinc.....	9.75c.
Lead (full sheets).....	10.00c. to 10.25c.

<b>Seamless Tubes—</b>	
High brass.....	25.37½c.
Copper.....	26.37½c.

<b>Rods—</b>	
High brass.....	18.25c.
Naval brass.....	20.25c.

<b>Wire—</b>	
Copper.....	17.87½c.
High brass.....	21.00c.
Copper in Rolls.....	24.00c.
Brazed Brass Tubing.....	28.50c.

### Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

<b>Sheets, 0 to 10 gage, 3 to 30 in. wide.....</b>	
Brass.....	33.00c.
Tubes, base.....	42.00c.
Machine rods.....	34.00c.

## Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	13.75c.	15.00c.
Copper, hvy. and wire.....	13.50c.	14.50c.
Copper, light and bottoms.....	11.50c.	12.75c.
Brass, heavy.....	7.75c.	9.00c.
Brass, light.....	6.50c.	7.50c.
Hvy. machine composition.....	10.25c.	11.25c.
No. 1 yel. brass turnings.....	9.25c.	9.75c.
No. 1 red brass or compos. turnings.....	9.50c.	10.50c.
Lead, heavy.....	5.25c.	5.625c.
Lead, tea.....	3.75c.	4.25c.
Zinc.....	3.25c.	3.625c.
Sheet aluminum.....	12.50c.	14.50c.
Cast aluminum.....	11.75c.	13.50c.

## Rolled Metals, f.o.b. Chicago

### Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

<b>Sheets—</b>	
High brass.....	20.50c.
Copper, hot rolled.....	25.00c.
Copper, cold rolled, 14 oz. and heavier.....	27.25c.
Zinc.....	10.00c.
Lead, wide.....	9.75c.
<b>Seamless Tubes—</b>	
Brass.....	26.87½c.
Copper.....	27.87½c.
Brass Rods.....	18.25c.
Brazed Brass Tubes.....	28.50c.

all classes of consumers is reported in a moderately active market. Orders are mostly for November delivery but some December contracts have been made. Prices are firm at 6.32½c., St. Louis, and 6.50c., New York, the latter being the contract quotation of the leading interest.

**Zinc.**—This market continues quiet, but producers report a fair amount of business nearly every day. The feature is the continued steadiness of prices at 6.25c., East St. Louis, or 6.60c., New York. The price of ore remains at \$40, Joplin, with production and sales last week again practically offsetting each other.

**Antimony.**—Chinese metal is unchanged in a very quiet market at 10.50c. for spot and 10.25c. for futures, duty paid, New York.

**Nickel.**—Ingot nickel in wholesale lots is unchanged at 35c., with shot

nickel at 36c. and electrolytic nickel at 37c. per lb.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

#### Non-Ferrous Metals at Chicago

**CHICAGO, Nov. 5.**—A substantial volume of spot business has been placed in this market and prices are stronger. The old metal market is active in small-lot sales and prices for the red metal grades are higher.

*Prices, per lb., in carload lots:* Lake copper, 16.75c.; tin, 50.25c.; lead, 6.40c.; zinc, 6.35c.; in-less-than-carload lots; antimony, 11c. On old metals, we quote copper wire, crucible shapes and copper clips, 12.50c.; copper bottoms, 11.25c.; red brass, 10.75c.; yellow brass, 8.25c.; lead pipe, 5c.; zinc, 3.50c.; pewter, No. 1, 27c.; tin foil, 27c.; block tin, 39c.; aluminum, 12c., all being dealers' prices for less-than-carload lots.

**MANSFIELD, OHIO,** 800 tons, building for Mansfield Tire & Rubber Co.

**CLEVELAND,** 150 tons, crane runway for Bourne-Fuller Co.

**CLEVELAND,** 100 tons, hangar for United States Air Line.

**BATTLE CREEK, MICH.,** 400 tons, National City Bank.

**FORT WAYNE, IND.,** 1500 tons, bank building.

**CHICAGO,** 10,000 tons, warehouse; Zuckery Davis, architect.

**MILWAUKEE,** 900 tons, garage.

**NORTHERN PACIFIC RAILROAD,** 1200 tons, bridges.

**LIBERTY BEND, Mo.,** 2500 tons, highway bridge across Missouri River.

**HELENA, MONT.,** 667 tons, bridge over Missouri River near Wolf Point; Missouri River Valley Bridge & Iron Co., low bidder.

**LONGVIEW, WASH.,** 13,000 tons, Longview-Rainier bridge; reported to have been tentatively awarded to Bethlehem Steel Co.

**SAN FRANCISCO,** 300 tons, two apartment buildings, Broadway near Laguna Street; bids being taken.

## Fabricated Structural Steel

### Chicago Warehouse Will Take 10,000 Tons—Awards of 26,500 Tons

**W**ITH a warehouse at Chicago calling for 10,000 tons, and a bridge at Longview, Wash., for 13,000 tons, new projects which have come out in the last week totaled 37,500 tons. The following awards, amounting to 26,500 tons, include no jobs of outstanding size:

**NEW YORK,** 10,640 tons reported to the Structural Steel Board of Trade; 6500 tons in the following jobs not previously reported: Column cores for buildings at Varick and Carleton Streets and at Spring Street and Sixth Avenue, and apartment building at Forty-eighth Street and Third Avenue, to Levering & Garrigues Co.; apartment building at 420 Lexington Avenue, to Paterson Bridge Co.; Midtown Hospital at 309 East Forty-ninth Street and Wilson Publishing Building at 952 University Avenue, to A. E. Norton, Inc.; apartment building at Eighty-sixth Street and East End Avenue, to Lehigh Structural Steel Co.

**BROOKLYN,** 250 tons, building for Brooklyn Ash Removal Co., Inc., to Shoemaker Bridge Co.

**NEW YORK CENTRAL RAILROAD,** 800 tons, bridge at Rensselaer, N. Y., to Phoenix Bridge Co.

**NEWARK, N. J.,** 920 tons, hotel at 15 Hill Street, to Hinkle Steel Construction Co.

**HOLLAND, N. J.,** 2000 tons, power house, to Belmont Iron Works.

**CUMBERLAND, MD.,** 1000 tons, plant for Celanese Corporation of America, to Pittsburgh Bridge & Iron Co.

**PHILADELPHIA,** 2800 tons, Atwater Kent Building, to Shoemaker Bridge Co.

**McKEES ROCKS, PA.,** 225 tons, building for Pressed Steel Car Co., to Pittsburgh Bridge & Iron Co.

**MERCER COUNTY, PA.,** 120 tons, bridge, to Pittsburgh-Des Moines Steel Co.

**PITTSBURGH,** 300 tons, Madison grade school, to J. E. Moss Iron Works.

**FORT ARTHUR, TEX.,** 1500 tons, refinery for Texas Co., to Petroleum Iron Works.

**SOUTHERN PACIFIC RAILROAD,** 600 tons, bridges, to American Bridge Co.

**BATTLE CREEK, MICH.,** 650 tons, building for Nichols & Shepard, to Indiana Bridge Co.

**DETROIT,** 350 tons, additions to plant of Hupmobile Motor Co., to Guilbert Steel Co.

**DETROIT,** 510 tons, Cunningham Store, to Whitehead & Kales Co.

**DETROIT,** 120 tons, building for Fisher Body Corporation, to Mahon Structural Steel Co.

**MILWAUKEE,** 200 tons, building for Ladish Drop Forge Co., to Hackendahl & Schmidt, local.

**MENOMINEE AND GREEN BAY, WIS.,** 2500 tons, bridges, to Wisconsin Bridge Co., Milwaukee.

**INDIANA HARBOR, IND.,** 5000 tons, mill building for Youngstown Sheet & Tube Co., to Hansell Elcock Co., Chicago; previously reported as 3935 tons.

**SAN BERNARDINO, CAL.,** 175 tons, telephone building, to Union Iron Works.

**LOS ANGELES,** 1800 tons, plates for six 118,000-bbl. tanks for Texas Co., to Western Pipe & Steel Co.

**LOS ANGELES,** 1650 tons, plates, three 170,000-bbl. tanks for Wilshire Oil Co., to Western Pipe & Steel Co.

**LOS ANGELES,** 565 tons, plates, one 80,000 and three 10,000-bbl. tanks for Hancock Oil Co., to Western Pipe & Steel Co.

#### Structural Projects Pending

Inquiries for fabricated steel work include the following:

**BOSTON,** 4000 tons, United Shoe Machinery Corporation office building.

**NEW HAVEN, CONN.,** 500 tons, armory.

**WHITE PLAINS, N. Y.,** 500 tons, Elks Club.

**STANDARD OIL CO. OF NEW JERSEY,** 500 tons, oil tanks in Texas.

**DURHAM, N. C.,** 300 tons, dormitory for Duke University.

## Reinforcing Steel

### Illinois Highway Work Calls for 1000 Tons

**A**WARDS of less than 2700 tons reported during the last week were considerably under the recent average. New projects, calling for 2400 tons, included 1000 tons for highway work in Illinois. Awards follow:

**BROOKLYN,** 100 tons, building for Carl H. Schultz Corporation, to Concrete Steel Co.

**BROOKLYN,** 200 tons, Pizer Building, to Kalman Steel Co.

**GLENS FALLS, N. Y.,** 100 tons, telephone building, to Kalman Steel Co.

**PHILADELPHIA,** 800 tons, building for Atwater Kent Mfg. Co., to Truscon Steel Co.

**CHICAGO,** 225 tons of rail and billet steel bars, apartment building at 2912 Commonwealth Avenue, to Concrete Engineering Co.

**EVANSTON, ILL.,** 300 tons of rail steel bars, apartment building, to Calumet Steel Co.

**MINNEAPOLIS, MINN.,** 500 tons of rail steel bars, Hodgson Building, to Inland Steel Co.

**ST. LOUIS,** 100 tons, garage at Ninth and Chestnut Streets, to Missouri Rolling Mills Corporation.

**SACRAMENTO, CAL.,** 350 tons, highway work in Ventura County, to S. Pearson.

#### Reinforcing Bars Pending

**BOSTON,** Brighton district, 220 tons, high school.

**BROOKLYN,** 165 tons, building for National Lead Co.

**BUFFALO,** 300 tons, Teachers' College.

**CHICAGO,** 300 tons, apartment building on Independence Boulevard; A. L. Himelblau, architect.

**SPRINGFIELD, ILL.,** 1000 tons, State highway work.

**HELENA, MONT.,** 114 tons, bridge over Missouri River near Wolf Point; Missouri River Valley Bridge & Iron Co., low bidder.

**SACRAMENTO, CAL.,** 188 tons, bridge over Southern Pacific tracks near Benham; bids Nov. 21.

**SACRAMENTO,** 129 tons, bridge in Orange County; bids opened.



## PERSONAL

J. LESTER PERRY, whose appointment as Worcester, Mass., district manager for the American Steel & Wire Co. was mentioned in THE IRON AGE, Sept. 20, has been associated with the company since young manhood, when he entered the cost department at the Worcester works. He has always been engaged in the Worcester district, comprising plants

man of the rope mill at South works in 1917 and later was assigned to the main office as wire rope engineer. In 1919 he was transferred to the New Haven plant, becoming assistant superintendent in 1922 and superintendent in 1925.

FREDERICK B. RENTSCHLER, president Pratt & Whitney Aircraft Co.,



M. W. REED



J. L. PERRY



C. F. HOOD

at Worcester, New Haven, Conn., and Trenton, N. J., and had been assistant district manager since 1925. He became assistant superintendent of the North works in 1916, superintendent of the South works in 1917 and superintendent of the North works in 1918, holding the latter position until his promotion in 1925. He succeeds CLINTON S. MARSHALL, who, after 50 years of service with the Steel & Wire company and its predecessor, the Washburn & Moen Mfg. Co., retires from the more strenuous duties of management to become district superintendent. In this position he will act in an advisory capacity.

CLIFFORD F. HOOD and MALCOLM W. REED, who have been named assistant district managers at Worcester, were previously superintendents at the South works and New Haven works, respectively. Mr. Hood was graduated in electrical engineering from the University of Illinois and has been continuously employed at the company's Worcester plants since leaving college except in 1917 and 1918. He began work in the cable department at South works and later served as superintendent of that division. He became assistant superintendent at South works in 1925 and superintendent in 1927. Mr. Reed is a graduate of the United States Naval Academy and served as an ensign in the navy before entering the wire rope department at the North works of the Steel & Wire company. He became fore-

Hartford, Conn., has been made a director of the newly formed Boeing Airplane & Transport Co.

GANO DUNN, president J. G. White Engineering Corporation, New York, has been made an alumni trustee of Columbia University, New York, to serve for six years. He was graduated from that university's School of Mines in 1891. Mr. Dunn is a former chairman of the Engineering Foundation, a former chairman of the National Research Council, and a past-president of the American Institute of Electrical Engineers.

CLIFFORD E. MESSINGER, vice-president Chain Belt Co., Milwaukee, has been elected a director of the Second Wisconsin National Bank, Milwaukee.

HORACE C. KNERR, consulting metallurgical engineer, Philadelphia, will address the Baltimore-Washington chapter of the American Society for Steel Treating at Baltimore on Friday evening, Nov. 16. His subject will be "The Use of Metals in Aircraft Construction."

HOWARD E. OBERG, for several years representative of the Billings & Spencer Co.'s machinery division at Detroit, has been called in to the main office at Hartford, Conn., to become sales manager of the machinery division.

C. J. FREUND, supervisor of apprentices for the Falk Corporation, Milwaukee, spoke on "Apprentice Training in Foundries" at the regular monthly meeting of the Wisconsin Gray Iron Foundry Group, held at the Republican House, Milwaukee, Nov. 7. HAROLD S. FALK, vice-president and works manager of the Falk Corporation, led the discussion.

JOHN E. OLSON, for many years with the Chicago sales organization of the Niles-Bement-Pond Co., has joined the sales force of the E. C. Cummings Co., 545 West Lake Street, Chicago, representing a number of well known manufacturers of machine tools.

W. H. WILLIAMS, who as vice-president of the Delaware & Hudson Co. was also senior vice-president of its subsidiary companies, the Chateaugay Ore & Iron Co. and the Hudson Coal Co., has resigned and has been succeeded as senior vice-president of the Chateaugay and Hudson companies by F. W. LEAMY, who is also vice-president of the Delaware & Hudson Co. J. R. LINNEY has been appointed vice-president in charge of operations of the Chateaugay and Hudson companies. RALPH W. CLARK, formerly New York manager of Pilling & Co., is vice-president and general sales agent of the Hudson Coal Co. The sales of low phosphorus pig iron made by the Chateaugay Ore & Iron Co. will be handled as heretofore by Pilling & Co., Philadelphia and New York.

DWIGHT E. WOODBRIDGE, Duluth, whose long connection with Lake Superior iron mining has made him well known to IRON AGE readers, has been appointed as directing engineer of Fremont Grant, Inc., 165 Broadway, New York, and will have charge of operations at the company's gold properties in Mariposa County, Cal. Bought by Gen. John C. Fremont in 1843, this tract of 70 square miles was found to carry 14 miles, or about one-fifth, of the great Mother Lode. In all about \$30,000,000 in gold has been taken from the Grant, but for 20 years it has been idle. Active development will begin soon and Mr. Woodbridge will establish operating headquarters at Mt. Bullion, Cal.

JAMES A. FARRELL, president United States Steel Corporation, MYRON C. TAYLOR, chairman of its finance committee, JOHN HULST, vice-president and chief engineer and I. LAMONT HUGHES, vice-president in charge of operations, made a few days visit last week of corporation plants at Lorain, Cleveland and Youngstown.

JOHN A. MANLEY, for the past three years manager of sales development for Fairbanks, Morse & Co., Chicago, has been elected vice-president in charge of sales. He was graduated

from Northwestern University in 1911 and entered the sales department of the Republic Tire & Rubber Co. After four years with this organization he joined the advertising staff of one of the Chicago newspapers. Later for years he was connected with Hart, Schaffner & Marx, studying the problems of the retail merchants.

FRED C. P. DANIELS, formerly division superintendent of No. 1 open-hearth furnace, steel and roll foundries and shops at the Bethlehem, Pa., plant of the Bethlehem Steel Co., has been named vice-president in charge of operations of the Garrison and Midland plants of Mackintosh-Hemphill Co., Pittsburgh. In this position Mr. Daniels returns to his first field of endeavor, having entered the employ of Mackintosh-Hemphill Co. upon his graduation from Worcester Polytechnic Institute in 1904. In 1911 Mr. Daniels became connected with the Pittsburgh Iron & Steel Foundries Co., Midland, Pa., as assistant superintendent and metallurgist, being particularly interested in the development of and pioneering in alloy products for the rolling mill industry. From 1914 until 1923 he was employed by the Wheeling Mold & Foundry Co., having been intimately connected with the sale, manufacture and use of iron, steel and alloy rolls. From 1923 until 1928 he was connected with the Bethlehem Steel Co.

### Visit America for Russian Tractor Plant

A commission of thirteen Soviet engineers engaged on the construction of the new \$17,500,000 Dzherzinsky tractor plant at Stalingrad has arrived in the United States to purchase equipment and arrange for engineering cooperation on the construction and layout. The delegation is headed by Mr. Tsentsipper, chief engineer on the construction work.

"The Dzherzinsky plant, on which work was recently begun, will have an annual capacity of 20,000 tractors and will be the largest tractor factory in the U. S. S. R.," stated Mr. Tsentsipper at the offices of the Amtorg Trading Corporation, New York. "We expect to complete the work by 1930 and to attain an output of 4000 tractors in 1932. The full capacity of the plant will be reached by 1935."

Tractors are also being produced in the U. S. S. R. in the Tractor Division of the Putilovetz Works in Leningrad, which has been producing 1500 tractors annually and is being enlarged to an annual capacity of 5000 tractors. During the current year it is expected to turn out 3000 tractors at the Putilovetz plant.

The Dzherzinsky commission will visit a number of American tractor plants and will arrange with a number of firms for special training of Soviet engineers in American production methods.

## OBITUARY

EGBERT HABBERTON GOLD, president Vapor Car Heating Co., Chicago, died Nov. 3, at his home at Holland, Mich. Born at Cornwall, Conn., he went to Chicago in 1890 and was for 15 years manager and director of the Gold Car Heating Co., which was later reorganized as the Vapor Car Heating Co.

RICHARD DEVENS, for the last year associated with the Link-Belt Co., Chicago, as sales engineer for its line of crane products in the Eastern territory, with headquarters at 233 Broadway, New York, died at his home in that city on Nov. 3. He was born at Boston 63 years ago and was graduated from the Massachusetts Institute of Technology in 1888. Prior to his association with the Link-Belt Co., he was for 22 years manager of the New York office of the Brown Hoisting Machinery Co., Cleveland.

WALTER W. NOWAK, European manager for the Niles-Bement-Pond Co. and the Pratt & Whitney Co., died in Paris on Nov. 1. He had been with the affiliated companies since his graduation from Cornell University in 1905, representing them at first on the Pacific Coast and later in Chile, Argentina and Brazil. While in Chile, he secured the contract for the equipment of the central repair shops of the Chilean State Railways, at that time the finest installation of the kind in South America. For the last 10 years, he had been in entire charge of the European business of the companies with headquarters in London and Paris. He was one of the best known American machine tool representatives in Europe.

ALBERT P. PREYER, district manager of sales at Cincinnati for the American Rolling Mill Co., Middletown, Ohio, died Oct. 30 at Hendersonville, N. C., following an attack of pneumonia. He was 43 years of age and a graduate of Cornell University.

SHAFFER N. HOLSTEIN, superintendent of the blooming and bar mills of the American Rolling Mill Co., Middletown, Ohio, died suddenly of acute indigestion on Oct. 29. He was 64 years of age and had been associated with the company for 15 years.

ALFRED G. PLACE, chief electrical engineer for the Youngstown Sheet & Tube Co., Youngstown, whose death in that city on Oct. 25 was mentioned in THE IRON AGE last week, was born at Woburn, Mass., Sept. 27, 1887. He was graduated from the Massachusetts Institute of Technology in 1908. He went to the Sheet & Tube company in 1913 as an electrical engineer. At the time of his death he was vice-

president of the American Institute of Electrical Engineers.

BURTON S. GIER, founder of the Gier Pressed Steel Co., Lansing, Mich., and a director of the Motor Wheel Corporation, died Oct. 19, at Rochester, Minn., aged 61 years. He went to Lansing in 1905 and in 1908 formed a partnership with Elmer Dail, which was known as the Gier & Dail Mfg. Co., to manufacture light pressed metal work. Out of this company grew two manufacturing plants, the Dail Steel Products Co. and the Gier Pressed Steel Co., the latter now being a unit of the Motor Wheel Corporation. Mr. Gier was vice-president and treasurer of the Motor Wheel Corporation until January, 1928, when he resigned on account of ill health.

FREDERICK S. BLACKALL, vice-president and general manager of the Taft-Peirce Mfg. Co., Woonsocket, R. I., whose death occurred on Oct. 6, was widely known as a consulting engineer, contractor and manufacturer of automatic machines, precision tools and printing machinery. He was born in Brooklyn 63 years ago. From 1888 until 1903 he was president of Blackall & Baldwin, New York electrical contractors. At the time of his death, besides his association with the Woonsocket company, he was president of the Interchangeable Parts Co., vice-president and general manager of the Mott Haven Co. and a director of Parks & Parks, Inc. In recent years Mr. Blackall had been forced, on account of ill health, to remain comparatively inactive in the management of his affairs, his son, Frederick S. Blackall, Jr., having assumed many of his responsibilities.

ARTHUR E. PARSON, treasurer and general manager of the Brown-Lipe Gear Co., Syracuse, N. Y., died on Oct. 31, on a train en route from Cleveland to Syracuse, of heart disease. He was 61 years of age and his early work as a patent attorney brought him into close association with the founders of the gear company. He served as legal advisor to the firm for a number of years and in 1911 became actively identified with it.

W. H. SHOEMAKER, consulting superintendent of erection for the Phoenix Bridge Co., Phoenixville, Pa., died suddenly Nov. 3, at his home in Phoenixville. He was 64 years of age and had been with the Phoenix company for about 30 years, the past 17 of which he was superintendent of erection. In August he was appointed consulting superintendent of erection, ill health having forced his partial retirement from business activity.



# Machinery Markets and News of the Works

## Outlook Continues Favorable

Machine Tool Demand Expected to Maintain Present Pace Through November and Possibly to End of Year

**A**LTHOUGH sales of machine tools in the past week in some centers fell off slightly, generally attributed to the approach of election day, the volume of inquiry carried over from last month gives reasonable assurance that business in November will at least equal that of October. In fact, the outlook for the remainder of the year is considered favorable.

Automobile companies are reported to have their shop equipment well rounded out for the production of new models, but in general industrial lines there is a good demand for single tools.

Tractor manufacturers in the Chi-

cago territory are looked upon as one of the most promising sources of business, notwithstanding their already large purchases this year. The International Harvester Co. is preparing a large list for its Fort Wayne, Ind., plant, and the Allis-Chalmers Mfg. Co., Milwaukee, intends to make sizable additions to the equipment of its tractor plant at Springfield, Ill.

The White Motor Co., Cleveland, has bought a dozen or more machines for the manufacture of a new type of truck motor. The E. W. Bliss Co., Brooklyn, has continued its purchases of tools for the production of the Bliss Jupiter airplane engine.

## New York

**N**EW YORK, Nov. 5.—A slight falling off in machine tool orders was generally attributed to the fact that it was pre-election week. A good deal of business is pending or in sight, and a continued good demand through the remainder of the year is expected, particularly if the outcome of the election is regarded favorably in business circles. The E. W. Bliss Co., Brooklyn, has placed additional orders for the manufacture of Bliss Jupiter airplane engines. Further expansion of facilities by the Wright Aeronautical Corporation may come within the next few months. Development of the aviation industry is one of the most promising signs for 1929.

Niles-Bement-Pond Co. has sold a 79-in. driving wheel lathe, four four-spindle drum-type milling machines, one eight-spindle drum-type milling machine, a 30-in. x 20-ft. Time-Saver lathe, a Niles-Acme 16-in. shaper, two Morris 3-ft. radial drills, Long & Alstatter I-beam punch, Marshalltown rotary shear, Burke tapping machine, Cincinnati high-speed bench tapping machine, Brown & Sharpe universal grinder, three Ransom grinders and a Cincinnati high-speed two-spindle drill. Pratt & Whitney division sold six No. 2 jig borers, 10 lathes of various types and sizes, No. 3 die sinker, two 6-in. vertical shapers and a No. 12 profiling machine.

Plans are being arranged by Montana Power Co., 25 Broadway, New York, for new hydroelectric power plant near Great

Falls, Mont., with initial capacity of 70,000 hp., to cost more than \$3,500,000 with transmission system.

Liquidometer Corporation has been organized with capital of 110,000 shares of stock, no par value, to take over and expand Liquidometer Co., Thompson Avenue, Long Island City, manufacturer of gasoline gages and other liquid measuring instruments. New company will develop output, including manufacture of seven new types of gages and instruments. A stock issue of \$750,000, is being sold, part of fund to be used for expansion. William S. Yerkes is president.

Kleinert & Klie, 250 Park Avenue, New York, architects, are completing revised plans for a six-story automobile service, repair and garage building at 798-804 Union Street, Brooklyn, to cost more than \$200,000 with equipment.

Crane Co., 836 South Michigan Avenue, Chicago, and 23 West Forty-fourth Street, New York, has purchased property on Dutch Kills Basin, Long Island City, totaling 77,000 sq. ft., for new factory branch and distributing plant, with pipe department, etc. Company has also acquired buildings and property at White Plains, N. Y., for a similar plant.

Horn Signal Mfg. Corporation, 290 Hudson Street, New York, manufacturer of traffic signal equipment, brass and bronze signs, etc., has arranged for sale of stock, part of fund to be used for expansion in production.

Kent Garage Investing Corporation, 350 Madison Avenue, New York, has purchased property, 100 x 140 ft., at Sixty-first Street and Ninth Avenue, for multi-story automobile service, repair and gar-

age building, to cost more than \$1,500,000 with equipment.

Improved Cider Co., 90 West Street, New York, has plans for a two-story metal reduction plant, 25 x 130 ft., at Brooklyn, to cost more than \$60,000 with equipment. Kleinert & Klie, 250 Park Avenue, New York, are architects.

Leslie W. Rolfe, 1718 Fifth Avenue, Troy, N. Y., and associates have organized Rolfe Pump & Machinery Corporation, and plans operation of local plant to manufacture pumping equipment, parts, etc. James W. Clark, 39 First Street, is interested in new company.

Western Electric Co., 195 Broadway, New York, has leased six-story building at Johnston Avenue and Pine Street, Jersey City, N. J., for new storage and distributing plant in conjunction with works at Kearny.

Jersey Central Power & Light Co., 20 South Street, Asbury Park, N. J., has purchased property on Raritan Bay, South Amboy, N. J., for new steam-operated electric generating plant, to have initial output of 50,000 kw. It is reported to cost more than \$4,500,000, instead of smaller amount previously noted.

Wright Aeronautical Corporation, Lewis Street, Paterson, N. J., has awarded contract to John W. Ferguson Co., 152 Market Street, for another plant unit, to cost about \$70,000.

Public Service Electric & Gas Corporation, Public Service Terminal, Newark, N. J., is completing plans for two-story power substation at Bloomfield, N. J., to cost over \$65,000 with equipment.

C. F. Pease Co., Chicago, maker of blue print machinery and drafting room supplies, has removed its New York sales room, formerly in Grand Central Terminal, to 12 East Forty-fourth Street where entire seventh floor will be occupied. T. K. Murney is Eastern sales manager.

Vandermark Mfg. Co., 510 Broadway, New York, has been organized to manufacture adjustable curtain rods. Alvah Vandermark is president.

Automatic Electric Steam Corporation, 1 East Forty-second Street, New York, has been organized as subsidiary of Ross Safety Switch Corporation to manufacture electrical equipment for electric steam radiation. Company is licensed under Ross patent rights and principal products are radiator control switches and electric immersion heating elements. All manufacturing is being done under contract.

## New England

**B**OSTON, Nov. 5.—Business in high-production machinery was fairly active the past week. One local house sold a number of machines to Massachusetts manufacturers, but details are withheld. The trade looks for better business before the close of 1928, as there has been a noticeable increase in inquiries for various types of lathes, jig

## The Crane Market

**N**EW inquiry for overhead cranes has been small in the past week, but there is some desirable business pending, and with election past increased business is expected. A number of inquiries for locomotive cranes are in the market from contractors, and two for export have been closed in the past week.

In the Pittsburgh district there is an inquiry for a 5-ton overhead crane from the Westinghouse Electric & Mfg. Co. for its East Pittsburgh, Pa., works. There is also an inquiry for a 5-ton, 44-ft. span crane for the Pottstown, Pa., plant of

McClintic-Marshall Co. and for a 5-ton, 57-ft. span crane for the Enamelled Metals Co., Etna, Pa.

In the Chicago district the Western Electric Co., is inquiring for a 2-ton, 70-ft. span crane and a 7½-ton, reel handling crane. The Chicago Bridge & Iron Co., is in the market for a 10-ton electric crane.

Among recent purchases are:

Ulen Contracting Co., 120 Broadway, New York, 25-ton locomotive crane for export from Industrial-Brownhoist Corporation.

Asiatic Petroleum Co., 65 Broadway, New York, 15-ton crawl-tread locomotive crane from the Austin Co.

Carnegie Steel Co., two 15-ton, 37-ft. span, double drum, mill type cranes for the Duquesne works, from Alliance Machine Co.

Ladish Drop Forge Co., Cudahy, Wis., 10-ton, overhead electric crane from a Wisconsin builder.

International Harvester Co., Rock Island, Ill., 10-ton, 39-ft. span, 5-motor, gantry crane from Milwaukee Electric Crane & Mfg. Corporation.

boring machines, presses and drilling equipment.

Used tool dealers are doing practically no direct business with users, but are selling some equipment in single units to salesmen who resell to manufacturers at prices higher than asked by machinery dealers. Inquiries for used tools are few.

Small tools continue to move freely, and it is expected that sales in 1923 in all probability will be the largest for any year since the war.

General Electric Co., West Lynn, Mass., has started work on a two-story, 20 x 100 ft. power house addition.

Work has been started on a one-story addition, 44 x 149 ft., by the Providence Lithograph Co., Prairie Avenue, Providence, R. I. Miscellaneous electrical equipment will be used.

Westfield Boy's Trade School, Westfield, Mass., C. Derby, principal, is having plans prepared for a two-story and basement addition, 72 x 118 ft. Ralph M. Sizer, 12 Elm Street, Westfield, is architect.

Ovens, power equipment, conveying and other machinery will be installed in new one-story plant, 100 x 150 ft., to be built by Fraser Baking Co., 50 Cherry Street, Burlington, Vt., to cost over \$85,000.

Horace R. Whittier Co., Bristol, Conn., has broken ground in Pequabuck, Conn., for an enameling plant, one-story, 50 x 100 ft. It recently sold its Bristol plant to a gas making company. Used and new baking and miscellaneous equipment will be required.

Lynd-Farquhar Co., 419-425 Atlantic Avenue, Boston, machine tools, will move to larger quarters at 326-330 Congress Street, South Boston, about Dec. 1.

Plans have been filed by Pratt & Whitney Aircraft Corporation, 450 Capitol Avenue, Hartford, Conn., for a one-story sheet metal shop addition.

Enterprise Mfg. Co., 164 First Street, Boston, manufacturer of copper and metal specialties, will establish a new plant at Cambridge, where production will be concentrated in future.

Gillette Safety Razor Co., 15 West First Street, Boston, has authorized increase in capital from 2,000,000 to 3,000,000 shares of stock, no par value, part of proceeds to be used for expansion.

Stamford Gas & Electric Co., Stamford, Conn., has plans for a new artificial gas plant, 50 x 105 ft., to cost over \$175,000.

Green Mountain Power Co., operated by People's Hydro-Electric Vermont Corporation, Montpelier, Vt., is planning new hydroelectric power project in Vermont

early next year, to cost more than \$1,000,000 with transmission lines. Company has work under way on similar project at Middlesex, Vt., to have initial capacity of 5000 hp. Arrangements have been concluded for purchase of hydroelectric and steam power plants of Woodbury Granite Co., near Hardwick, Vt., to be improved for increased capacity. E. C. Deal is president.

Officials of Wetmore-Savage Automobile Equipment Co., 584 Commonwealth Avenue, Boston, have organized Wetmore-Savage Aircraft Corporation, with capital of \$105,000, to operate local manufacturing and distributing plant. Robert B. Wetmore is president, and Charles Hyde, treasurer.

Providence Brass & Aluminum Foundry Co., 219 Aborn Street, Providence, R. I., has been organized to manufacture brass, bronze and other metal castings. Company has plant at above address and is in market for additional furnace molding machine and ingot metals. Arsen G. Avedisian is proprietor.

Landers, Frary & Clark, New Britain, Conn., have awarded contract to Morton C. Tuttle Co., Boston, for one-story enameling building, 135 x 200 ft., and one-story storage building, 30 x 123 ft. Platforms and concrete roadway are included and estimated cost of entire operations is \$110,000.

## South Atlantic

**B**ALTIMORE, Nov. 5.—Western Electric Co., 195 Broadway, New York, has acquired 125 acres at River View Park, Baltimore, for new plant for which plans will be drawn at once. Initial unit is reported to cost more than \$5,000,000.

Virginia-Carolina Rubber Co., 3500 Lewis Street, Richmond, Va., manufacturer of automobile tires, etc., is arranging expansion program to cost more than \$400,000, including buildings and equipment. Department will be established for production of mechanical rubber goods in addition to present output. Company is arranging for sale of note and stock issues to total about \$500,000.

Board of District Commissioners, District Building, Washington, will receive bids until Nov. 15, for metal shop, wood shop, including 11 motor-driven wood-turning lathes, and foundry equipment for McKinley high school, until Nov. 19 for 3041 steel single tier lockers for public schools.

Virginia Public Service Co., Charlottesville, Va., is disposing of bond issue of \$3,000,000, part of proceeds to be used for extensions and improvements, including transmission line construction. Company is said to be planning hydroelectric

power plant on Big and Little Rivers, Rockbridge County, to cost about \$2,000,000.

Board of Education, Baltimore, is said to be planning installation of manual training equipment in new three-story Northeast junior high school to cost \$500,000, for which bids will soon be asked on general contract. William W. Emmart, Union Trust Building, is architect; C. L. Reeder, 916 North Charles Street, is mechanical engineer.

Draper Mfg. Co., Hopedale, Mass., manufacturer of textile looms and other textile machinery, has taken options on property near Spartanburg, S. C., for new branch assembling plant, to cost more than \$65,000 with equipment.

Chamber of Commerce, Charleston, S. C., is at head of project to construct and operate municipal airport on 800 acres at Ten-Mile Station, to include hangars, repair and reconditioning shops and other units, to cost more than \$60,000.

Joseph E. Sperry, Calvert Building, Baltimore, architect, has filed plans for five-story automobile service, repair and garage building to cost about \$200,000 with equipment.

Albert Lewis, Greenville, S. C., and associates plan construction of one-story ice-manufacturing plant, 75 x 100 ft., to cost about \$70,000 with equipment.

Salem Quarries, Inc., Winston-Salem, N. C., is planning an expansion program, including installation of quarrying, crushing and other machinery, power equipment, etc.

Lorenson-Harbottle, Inc., Aberdeen, N. C., has been organized to engage in fabrication of sheet metal, plates and shapes, including such products as vegetable bins, waste baskets, radiator enclosures. Company will also specialize in repair and maintenance of motors and power equipment. Plant has been erected and machinery installed.

## Philadelphia

**P**HILADELPHIA, Nov. 5.—Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has authorized electrification of its lines from New York to Philadelphia and thence to Wilmington, Del., about 325 miles, to be carried out over a period of seven to eight years at cost of about \$100,000,000, to be expended at rate of approximately \$15,000,000 per year; 60 per cent of cost will be for overhead transmission and catenary line construction, power substations, switching stations, etc., and 40 per cent for rolling stock. Initial work will cover electrification between Trenton and Philadelphia during coming year. Contracts



have been made with Philadelphia Electric Co. and Public Service Electric & Gas Co., Newark, N. J., for power supply and these utilities will expand generating and transmission facilities.

Lumber & Millwork Co., York Road, Philadelphia, will erect two-story addition to cost about \$50,000.

Publicker Commercial Alcohol Co., Snyder Avenue and McKean Street, Philadelphia, will rebuild plant destroyed by fire Oct. 28.

Keystone Brass & Rubber Co., 326 Arch Street, Philadelphia, has leased two floors in building at 117 North Third Street for expansion.

Philadelphia Nonferrous Foundry Co., Philadelphia, has been formed by Edward W. Taylor, Jr., 3030 Queen Lane, and associates, to operate a local plant for production of aluminum, brass, bronze and other metal castings. Andrew R. McCown, 814 Carpenter Street, is also interested in new organization.

New interests have become identified with Bellanca Aircraft Corporation, Wilmington, Del., and plans are being arranged for expansion. About \$2,000,000 will be added to company capital, considerable part of fund to be used for development work. Company has secured an initial order for 300 airplanes for an aviation service to be operated in West Virginia. Giuseppe M. Bellanca will continue as head of company.

School District of Upper Darby Township, Upper Darby, Pa., care of Heacock & Hokanson, 1211 Chestnut Street, Philadelphia, architects, plans installation of manual training equipment in new two-story junior high school to cost \$750,000, for which bids are being asked on general contract until Nov. 15.

Vacuum Oil Co., 61 Broadway, New York, has plans for a three-story addition, 40 x 80 ft., to its lubricating oil plant at Paulsboro, N. J., to cost over \$50,000 with equipment. H. J. Wright is chief engineer.

Diamond Machine Co., 453 North Marshall Street, Philadelphia, has purchased local property for new one-story tool manufacturing plant and machine works, to cost over \$40,000,000 with equipment.

George Bendon, Philadelphia, has leased property at 118 East Cumberland Street for a machine and automobile repair shop.

E. Keeler Co., Williamsport, Pa., manufacturer of boilers, has removed its Philadelphia office from Rush Building to 711 Bulletin Building. George W. Crawford and H. L. Peel are sales engineers in charge.

## Buffalo

**B**UFFALO, Nov. 5.—Contract has been let by Joseph A. Sanders, 115-17 Lathrop Street, Buffalo, manufacturer of sheet metal products, roofing, etc., to William A. Walker, 24 Vernon Place, for two-story addition to cost about \$50,000 with equipment. H. E. Plumer & Associates, 775 Main Street, are architects and engineers.

New York Central Railroad Co., Buffalo, and 466 Lexington Avenue, New York, is said to be arranging early call for bids for one and two-story car repair shops at East Buffalo yards, to cost over \$65,000. F. B. Freeman is chief engineer.

Stewart Motor Corporation, 93 Dewey Avenue, Buffalo, manufacturer of motor trucks, has awarded general contract to Crooker & Carpenter, Crosby Building, for one-story addition, to cost about \$30,000 with equipment.

Officials of New York Car Wheel Co., Niagara Street and Forest Avenue, Buffalo, headed by Frederick B. Cooley, president, have acquired a substantial interest in Houde Engineering Corporation, 537 East Delavan Avenue, manufacturer of automobile shock absorbers. Houde company has work under way on addition to triple, approximately, present capacity.

Pratt & Letchworth Co., 189 Tonawanda Street, Buffalo, manufacturer of steel and malleable iron castings, has work under way on a one-story addition to power department, to cost about \$20,000.

Emil Steinhurst & Sons, Inc., 1158 Mohawk Street, Utica, N. Y., manufacturer of gas fired hot air furnaces, radiator shields and inclosures and other sheet metal products, is installing new power-driven machinery for production of heavy sheet metal shapes. Company will then be in position to manufacture steel stair raisers, road decks, metal shelving and other products.

Glor Brothers & Willis Mfg. Co., Attica, N. Y., maker of farm machinery and equipment, has been dissolved and business will be taken over by Hudson Mfg. Co., Hastings, Minn. Hudson company is said to be planning to spend \$100,000 in new buildings and equipment.

## Cleveland

**C**LEVELAND, Nov. 5.—Machine tool inquiry is plentiful, but sales were not as large the past week as during the early part of the month. October business with most dealers showed a gain over September. The White Motor Co. has purchased a dozen or more machines required to manufacture a new type of truck motor. Orders from the automotive industry in the Michigan territory have declined following active buying, and it is believed that motor car companies now have their equipment well rounded out.

Wheeling & Lake Erie Railway has sent out an inquiry for estimating purposes for an 80-in. wheel press and horizontal punching machine. Plants of local machine tool builders are well filled with orders, and deliveries are slow. A manufacturer of drilling machinery reports that it has more orders on its books at present than at any previous time in its history.

Wheeler Radiator Mfg. Co., 1637 Colamer Road, Cleveland, is enlarging its plant by an addition to its office and extensions to its manufacturing department. Latter will include a chromium plating department.

Plans are being completed by Atlas Foundry Co., West Sixty-ninth Street, Cleveland, for one-story addition, 32 x 90 ft., to cost about \$38,000 with equipment. A. G. Simon, Hippodrome Building, is architect.

Gears & Forgings, Inc., 3010 Woodhill Road, Cleveland, has awarded general contract to Industrial Construction Co., 308 Euclid Avenue, for three-story and basement addition, 72 x 72 ft., to cost about \$50,000 with equipment.

City Council, Lorain, Ohio, has authorized purchase of steam turbine and auxiliary equipment for municipal pumping plant, to cost about \$28,000.

City Ice & Fuel Co., 6611 Euclid Avenue, Cleveland, is disposing of a preferred stock issue of \$2,400,000, part of proceeds to be used for expansion, including new ice-manufacturing plants. Plans are under way for new plant at

Willoughby, Ohio, to cost about \$200,000 with equipment.

Timken Roller Bearing Co., Canton, Ohio, plans new one-story manufacturing addition, 131 x 285 ft., to cost more than \$125,000 with equipment. An addition is also proposed for storage and distributing service.

Goodyear-Zeppelin Corporation, Akron, Ohio, a subsidiary of Goodyear Tire & Rubber Co., has approved purchase of site at Fulton Flying Field for construction of plant to manufacture two Zeppelin aircraft for Government, and similar units, consisting of main steel hangar, 360 x 1200 ft., and 200 ft. high, with machine and repair shops, metal-working shop, woodworking department, assembling buildings, and other units, to cost more than \$2,000,000 with equipment. Wilbur Watson & Associates, 4614 Prospect Avenue, Cleveland, are architects and engineers. Paul W. Litchfield is president.

Smith-Armstrong Forge, Inc., 1209 Marquette Road, Cleveland, has been organized to operate metal forge and machine shop. Building has been leased and contract let for remodeling. Equipment orders have been placed, and machinery will probably be installed and ready for operation Dec. 15. Company's product will include forgings for cam and crankshafts, spindles, gear blanks and pinions, bevel gears, die blocks and special parts for automobiles and machine tools. Stock of alloy steels, open-hearth, electric and tool steels and irons will be carried.

## Chicago

**C**HICAGO, Nov. 5.—Inquiry for machine tools carried over from last month bulks large and fresh requests for prices indicate an unusually favorable outlook for November. Business is still quite widely scattered in this territory and in diversified industries. Purchases on a larger scale are indicated by agricultural machinery manufacturers.

International Harvester Co. is preparing a list for its Fort Wayne, Ind., works and Allis-Chalmers Mfg. Co., Milwaukee, plans sizable additions to its tractor plant at Springfield, Ill. It is probable that Emerson-Brantingham Co., Rockford, Ill., will place large orders concurrent with transfer of J. I. Case Threshing Machine Co.'s tractor plant from Racine, Wis., to Rockford. Nash Motors Co., Racine, Wis., is in market for two 16-in. lathes, and the Chicago Board of Education will buy a 16-in. back geared shaper.

Bids will soon be asked by Buda Co., Harvey, Ill., manufacturer of railroad equipment and appliances for one-story addition, to cost about \$70,000 with equipment. Perkins, Chatten & Hammond, 160 North LaSalle Street, Chicago, are architects.

Electric Household Utilities Corporation, South Fifth Avenue and Twenty-second Street, Chicago, will soon begin superstructure for one and two-story plant, 80 x 80 ft., and 80 x 400 ft., at Cicero, Ill., to manufacture electrically-operated domestic appliances, to cost more than \$100,000 with equipment. R. E. Pingrey, 134 North LaSalle Street, is architect.

Standard Oil Co. of Indiana, Inc., 910 South Michigan Avenue, Chicago, will soon begin construction of one-story storage and distributing plant at Mattoon, Ill., to cost about \$80,000 with equipment.

Andrews Wire & Iron Works, 1802 Preston Street, Rock Island, Ill., has awarded general building contract to

Holm-Page Co., 2117 Kishwaukee Street, for one-story addition, 100 x 125 ft., to cost more than \$80,000 with equipment.

Altorfer Brothers Co., Peoria, Ill., manufacturer of electric washing machines and parts, is disposing of a preferred stock issue of \$1,395,000, part of proceeds to be used for expansion. Company is planning one-story unit, 100 x 600 ft., to cost more than \$200,000 with equipment.

General Mills, Inc., Chamber of Commerce Building, Minneapolis, Minn., has awarded general contract to Pike & Cook Co., 416 South Fifth Street, for rebuilding part of flour mill recently destroyed by fire.

Federal Sign Co., 1215 Nicollet Avenue, Minneapolis, Minn., manufacturer of electric and other displays, has asked bids on general contract for new two-story plant to cost about \$35,000. Larson & McLaren, Baker Building, are architects.

Addison Cut Stone Co., 4424 Addison Street, Chicago, has acquired property 109 x 600 ft., for construction of new one-story stone-cutting and finishing plant, to cost more than \$70,000 with machinery.

Star Ornamental Iron Co., 2600 East Twenty-sixth Street, Minneapolis, has been organized to engage in ornamental iron work. Company has plant completely equipped but is in market for materials.

Moline Mfg. Co., Moline, Ill., which early this year succeeded Wilson Body Mfg. Co., is diversifying its line of products and discontinuing largely line of automobile bodies. It is also preparing to introduce line of playground equipment.

Kennedy-Van Saun Mfg. & Engineering Corporation, 2 Park Avenue, New York, manufacturer of crushing, mining and cement machinery and pulverized coal equipment, has established Kennedy-Van Saun Co. of Illinois, 120 South LaSalle Street, Chicago, to handle its business in that territory. T. J. Shearer is manager.

## Pittsburgh

**P**ITTSBURGH, Nov. 5.—Interest of the machine tool trade centers in the new Aston process iron plant of the A. M. Byers Co. at Harmony, Pa. No formal inquiry yet has appeared, but dealers are looking for one including the requirements for an entirely new machine shop. Westinghouse Electric & Mfg. Co. is buying in a moderate way against its fourth quarter list. Day to day orders are fairly numerous, and business on the whole is reasonably satisfactory.

Plans are being considered by Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, for two-story addition to branch plant at Crystal City, Mo.; 100 x 1000 ft., to cost more than \$750,000 with equipment. Engineering department of company is in charge.

Waverly Oil Works, Inc., Thorn Street, Coraopolis, Pa., will rebuild portion of local lubricating oil plant destroyed by fire Oct. 28. Headquarters are at Fifty-fourth Street and Allegheny Valley Railroad, Pittsburgh.

New interests, headed by Henry S. Sherman and Ralph H. Tate, latter head of Ralph H. Tate Co., Inc., First National Bank Building, Pittsburgh, steel products, have purchased Fort Pitt Spring & Mfg. Co., Pittsburgh, with plant at McKees Rocks, Pa. Company name will be changed to Fort Pitt Spring Co. and expansion carried out. William McBride, heretofore president, has retired from that office.

Mackintosh-Hemphill Co., foot of

Twelfth Street, Pittsburgh, manufacturer of rolling mill machinery, etc., has asked bids on general contract for one-story branch plant at Wooster, Ohio, to cost about \$80,000 with equipment.

Wheeling Electric Co., Wheeling, W. Va., has acquired electric light and power properties of Wheeling Public Service Co., exclusive of traction system. Plans are under way for extensions, including power line construction.

Board of Education, Beaver Falls, Pa., is said to be planning installation of manual training equipment in new high school to cost \$250,000, for which plans will be drawn by Carlisle & Sharrer, Martin Building, Pittsburgh, architects.

## Cincinnati

**C**INCINNATI, Nov. 5.—Machine-tool builders report that sales in October showed a gain over those of September and that the past three months have been the best period for new bookings since 1920. While much of the business has come from the automotive industry, the volume of buying in many lines has been surprisingly good. Geographically, purchases have been well distributed, even the Pacific Coast having contributed its share.

Just what turn demand will take in the next few weeks is puzzling some manufacturers, although the majority are of the opinion that activities will be well sustained at or near the present level. Even if there is a considerable drop in orders, which would be a somewhat unexpected development, there is enough business on the books of local companies to keep operations at a high point during the remainder of the year. This fact is evidenced by the extended deliveries quoted on many types of machines. Preference for small tools and for larger equipment designed for high production work is shown by most buyers.

To what extent automobile makers will come into the market for equipment in the next two months is a matter of speculation, but indications are that companies which already have made substantial purchases in connection with the production of new models will buy additional machines shortly when increased operating schedules have been decided upon. This particularly applies to some units of the General Motors Corporation.

Revised plans are being drawn for one-story addition, 165 x 485 ft., and boiler plant for Leland Electric Co., 222 North St. Clair Street, Dayton, Ohio, manufacturer of small motors, armatures, etc., to cost more than \$225,000 with equipment. Ballinger Co., Twelfth and Chestnut Streets, Philadelphia, is architect and engineer.

Falls City Ice & Beverage Co., Broadway and Thirty-first Street, Louisville, is planning expansion program, including erection of two one-story mechanical shops, extensions in ice department and bottling division, with conveying and other handling equipment, to cost more than \$50,000.

Plans have been arranged for reorganization of American Holst Co., Hamilton Bank Building, Chattanooga, Tenn., with change of name to American Automobile Appliance Co., capitalized at \$1,000,000. Expansion will be carried out, with extension in production to include automatic air brakes, axle type automobile elevators and kindred equipment.

Cincinnati Grinders, Inc., South Oakley, Cincinnati, has awarded general contract

to Austin Co. for one-story plant to cost about \$65,000, with equipment.

Hart, Freeman & Roberts, Independent Building, Nashville, Tenn., architect, have plans for new multi-story automobile service, repair and garage building, to cost more than \$150,000 with equipment.

## St. Louis

**S**T. LOUIS, Nov. 5.—Contract has been let by Metalcraft Corporation, 4215-19 Clayton Avenue, St. Louis, to Schooley & Chamblin, 6038 Delmar Boulevard, for new one-story plant to cost about \$65,000 with equipment.

Laclede Steel Co., St. Louis, is inquiring for a 42-in. x 29-ft. geared head motor-driven lathe.

N. S. Sherman Machine & Iron Works, 18 East Main Street, Oklahoma City, Okla., is completing plans for one-story addition, 50 x 140 ft., to cost about \$35,000.

Parks Aircraft, Inc., Missouri Theatre Building, St. Louis, has awarded general contract to St. Louis Structural Steel Co., Fifty-seventh Street, for initial unit of aircraft manufacturing plant at East St. Louis, comprising parts and assembling departments, one-story, 100 x 550 ft., to cost more than \$150,000 with equipment. Company was organized recently by Russell E. Gardner, head of Gardner Motor Co., Main Street, and associates. Superintendent, Sequoyah O. T. School, Tahlequah, Okla., is asking bids until Nov. 12 for one duplex power pump, capacity 100 gal. per min., and for one two-stage air compressor.

Atlas Tool & Mfg. Co., 5707 Manchester Street, St. Louis, will soon begin construction of new one-story plant, 60 x 100 ft., to cost about \$20,000 with equipment.

Oliver-Cadillac Co., 3222 Locust Boulevard, St. Louis, representative for Cadillac automobile, is having plans drawn for three-story service, repair and sales building, to cost about \$100,000 with equipment.

City Council, Trenton, Mo., is having plans drawn by Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., engineer, for extensions and improvements in municipal power plant, including additional equipment.

## Detroit

**D**ETROIT, Nov. 5.—Plans are being considered by Detroit Gear & Machine Co., 670 East Woodbridge Street, for four-story addition, 70 x 140 ft., to cost about \$80,000 with equipment.

Tri-Service Mill Building Supply Co., 269 Thirty-second Street, Battle Creek, Mich., is considering one-story addition, to cost more than \$30,000 with equipment.

Rich Tool Co., 1501 East Ferry Street, Detroit, recently organized to take over and operate company of same name, manufacturer of valves and other forged parts for automobile engines, etc., is disposing of stock issue to total about \$3,487,000, part of proceeds to be used for expansion.

Wood Hydraulic Hoist & Body Co., 7924 Riopelle Street, Detroit, has awarded general contract to Otto Randolph, Inc., 53 West Jackson Boulevard, Chicago, for one-story addition, 50 x 340 ft., to cost more than \$75,000 with equipment.

Weber & Pitcher, Fullerton Street, Detroit, manufacturers of chassis for small



trucks and other cars, are said to be planning early rebuilding of part of plant recently destroyed by fire.

Gliders, Inc., Detroit, recently organized with capital of \$37,500 by A. V. Verville, 3318 Tuxedo Street, and associates, plans early operation of local plant to manufacture motorless airplanes. W. J. Scripps, 8100 East Jefferson Street, is also interested in company.

Upton Machine Co., Edgewater Street, St. Joseph, Mich., is considering one-story addition to cost about \$25,000. L. C. Upton is head.

Oakland Motor Car Co., Pontiac, Mich., is having plans drawn for two-story addition, 50 x 100 ft., to cost about \$60,000. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

Wilcox-Rich Corporation, Wilcox Products Division, Saginaw, Mich., manufacturer of automobile parts and equipment, plans one-story addition, 35 x 275 ft., to cost about \$60,000 with equipment.

Motor Wheel Corporation, Saginaw Street, Lansing, Mich., has awarded general contract to H. G. Christman Co., Lansing, for one-story addition, to cost about \$175,000 with equipment. Company is also considering two other one-story units for hub division and for die and tool department.

Szekely Automotive Parts Corporation, Holland, Mich., has been organized as subsidiary to O. E. Szekely Corporation to manufacture piston rings. Company later expects to widen its field to include other automotive parts and accessories

## Gulf States

**B**IRMINGHAM, Nov. 5.—Plans have been filed by United States Cast Iron Pipe & Foundry Co., American Traders National Bank Building, Birmingham, for one-story plant addition, 80 x 255 ft., to cost close to \$40,000 with equipment.

Chamber of Commerce, Lubbock, Tex., is at head of project to construct and operate a municipal airport, including hangar, repair and reconditioning shop and other units, to cost approximately \$50,000.

Fleischmann Co., 327 South La Salle Street, Chicago, manufacturer of yeast, has plans for two-story addition to branch factory at Houston, Tex., 75 x 100 ft., to cost about \$70,000 with equipment.

City Commission, St. Petersburg, Fla., has authorized plans for a municipal airport in port district, to be known as Albert Whitted airport, with hangars, repair and reconditioning shops and other units.

De Soto Foundry & Machine Co., Mansfield, La., has arranged for bond issue of \$75,000, part of proceeds to be used for expansion in production facilities, particularly in steel castings.

Alabama Power Co., Birmingham, has work in progress on first unit of new steam-operated electric generating plant at Gorgas, Ala., and is scheduling completion in about six months. It is estimated to cost about \$5,000,000; complete project, with transmission lines, will cost approximately \$20,000,000.

Rome Wire Co., Bay Front, Mobile, Ala., has awarded general contract to Doulett & Ewin, Meaher Building, for one-story unit, to cost more than \$30,000 with equipment.

Pan-American Petroleum Corporation, Edwards Hotel Building, Jackson, Miss., has plans for new storage and distributing plant, with part to be equipped for barreling service, to cost about \$100,000.

R. J. Cummings, Bankers Mortgage Building, Houston, Tex., architect, is completing plans for multi-story automobile service, repair and garage building, 100 x 130 ft., at Corpus Christi, Tex., to cost about \$100,000 with equipment.

Tangipahoa Parish School Board, Amite, La., is said to be planning installation of manual training equipment in two-story high school at Independence, to cost \$160,000, for which bids will be asked about middle of November on general contract. Robert H. Goodman, Bank of Baton Rouge Building, Baton Rouge, La., is architect.

General Water Works & Electric Corporation, Fort Worth, Tex., operating Texas-Louisiana Power Co., Fort Worth, and other electric light and power utilities, has arranged for sale of preferred stock to total \$1,400,000, a portion of proceeds to be used for expansion, including transmission lines.

Stockham Pipe & Fitting Co., Birmingham, will erect two-story warehouse and shipping building, 104 x 251 ft., and laboratory, 60 x 95 ft. Contract has been placed with H. K. Ferguson Co., Cleveland. It is expected that plant will be finished by Jan. 1.

## Pacific Coast

**S**AN FRANCISCO, Nov. 1.—Santa Fe Railway Co., Los Angeles, has plans for one-story ice-manufacturing and pre-cooling plant, 100 x 184 ft., at Bakersfield, Cal., to cost \$185,000 with machinery.

Hall-Scott Motor Co., Pine Street, Berkeley, Cal., has awarded general contract to Austin Co. of California, Ray Building, Oakland, for one-story factory unit to cost about \$35,000 with equipment.

Board of Regents, University of California, Berkeley, is said to be planning new central power plant on campus, to cost about \$400,000 with equipment.

Pacific Goodyear Co., Los Angeles, subsidiary of Goodyear Tire & Rubber Co., Akron, Ohio, will carry out an expansion program at local mill, to cost more than \$250,000 with machinery.

Pacific Aero Motive Corporation, 3417 Angeles Mesa Drive, Los Angeles, manufacturer of aircraft equipment, is completing plans for one-story addition, 50 x 120 ft. Harbin Hunter, Rives-Strong Building, is architect.

Edward Hines Western Pine Co., Burns, Ore., has plans for addition to mill to cost about \$75,000 with equipment. Peter Swan, Lewis Building, Portland, is engineer and will be in charge of machinery purchases.

Palin & Sons, Inc., Tacoma, Wash., will rebuild portion of oil refinery recently destroyed by fire.

Board of County Supervisors, Hall of Records, Los Angeles, is asking bids until Nov. 19 for deep well pumping machinery and accessory equipment for County farm property.

Bach Aircraft Co., Los Angeles, has asked bids on general contract for new plant at Metropolitan Airport, near North Hollywood, comprising two main units, 100 x 200 ft., and 50 x 65 ft., to cost approximately \$45,000 with equipment. Mark M. Falk, Washington Building, is architect.

St. Helens Pulp & Paper Co., St. Helens, Ore., has awarded general contract to A. Guthrie & Co., Sherlock Building, Portland, for new one-story

mill, 215 x 320 ft., to cost over \$150,000 with equipment.

Harbor Plywood Co., Aberdeen, Wash., is planning to rebuild part of mill destroyed by fire Oct. 22.

## Indiana

**I**NDIANAPOLIS, Nov. 5.—Plans are being completed by C. R. Wermuth, 1036 St. Marys Street, Fort Wayne, Ind., for one-story machine shop, 75 x 108 ft., to cost about \$21,000 with equipment. Pohlmeier & Pohlmeier, Central Building, are architects.

Richmond Casket Co., Sixteenth and F Streets, Richmond, has plans for four-story plant, to cost over \$50,000 with equipment. F. J. Hughes, Inc., U. B. Building, Dayton, Ohio, is architect.

International Harvester Co., 606 South Michigan Avenue, Chicago, has awarded general contract to G. E. Dahm, 319 North Twenty-sixth Street, Lafayette, for one-story machine shop at Lafayette, to cost about \$50,000 with equipment.

Groble Gas Regulator Co., 233 Sycamore Street, Anderson, manufacturer of gas-burning apparatus, has plans for one-story addition, 25 x 80 ft., to cost about \$25,000. E. F. Miller, Farmers Trust Building, is architect.

Auburn Automobile Co., Auburn, has purchased adjoining property for addition for which plans will soon be drawn. New unit will be equipped in part for engineering and experimental work and will cost more than \$75,000. Company is completing expansion program at branch plant at Connersville, to include assembling department, enameling unit and final testing department, to cost about \$450,000 with equipment.

Part of plant of Advance Stove Works, Evansville, was recently damaged by fire.

Globe Gas Regulator Co., Anderson, is clearing ground for an addition, 24 x 80 ft., to be used as an assembly room.

## Canada

**T**ORONTO, Nov. 5.—October machine tool sales showed a slight increase over those for September, which was one of the best months this year. Both current and prospective demand is at a satisfactory level. It consists mostly of single tools for replacement, but several small lists have recently been received and are now being figured on. The automobile industry is showing more interest in the market, and lists are being prepared by the Chrysler Motor Co., at Walkerville, Ont., for equipment for a new plant. Other business of a like nature is in prospect. Demand for wood-working tools and equipment is also expanding.

Officials of Chrysler Motor Co., which recently purchased a 70-acre site at Walkerville, Ont., where it will start work immediately on erection of a \$1,500,000 plant, state that this will be first of three such units contemplated for company's expansion in Canada. Construction work on first unit will be started within a few weeks. Five-story block of new unit will be 100 x 1000 ft., and monitor plant, 280 x 1000 ft.; a loading dock, 60 x 450 ft., will also be included in initial work.

Cozens Spring Service, 2 Wood Street, Toronto, has started work on a new manufacturing plant to cost \$55,000, for pro-

duction and repair of automobile springs, etc.

Mississippi Iron Works, Almonte, Ont., is moving its business to Hull, Que., where it is establishing a plant to manufacture agricultural implements. Company will in future be known as Hull Implement Co. A. K. MacLean, formerly with Massey-Harris Co., is managing director of Hull works.

Town of Capreol, Ont., contemplates spending \$150,000 on sewage disposal system, of which \$30,000 will be required for pump house and equipment. James, Proctor & Redfern, Ltd., Excelsior Life Building, Toronto, is engineer.

Fairchild Aviation Co., Grand Mere, Que., contemplates establishment of local plant to manufacture airplanes, etc., to cost \$500,000.

B. J. Coghlin Co., Ltd., 2050 Ontario Street East, Montreal, manufacturer of railroad and automobile springs, bumpers, etc., will start work at once on an addition to its plant. Dakin Construction Co., Ltd., 270 Beaumont Street, has general contract. Equipment not yet been purchased.

Rideau Power Co. will rebuild its plant at Merrickville, Ont., to replace power plant recently destroyed by fire.

Canadian Rail & Harbor Terminals, Ltd., foot of York Street, Toronto, contemplates erection of a grain elevator at Meaford, Ont., to cost \$500,000 and to have capacity of 1,000,000 bu. C. D. Howe & Co., Whalen Building, Port Arthur, Ont., are engineers.

#### Western Canada

Bids will be called soon by Victoria Cold Storage & Terminal Warehouse Co., Ltd., Victoria, B. C., for two buildings and power plant units, also for equipment for operating \$500,000 Ogden Point cold storage plant.

Western Steel Products, Ltd., St. Boniface, Man., contemplates building an addition, 100 x 100 ft., to its Regina, Sask., plant.

Poole Construction Co., Hamilton and Eighth Streets, Regina, Sask., have received contract for a \$200,000 factory at Lorne and Fourth Streets, for Canadian Industries, Ltd., head office, Toronto, Ont.

Municipal authorities, Chilliwack, B. C., are asking for prices and information on rock crushing equipment for road building.

Gillespie Grain Co., Edmonton, Alta., is contemplating building a local grain elevator to cost \$350,000.

## Milwaukee

MILWAUKEE, Nov. 5.—The matter of production remains probably the most important problem confronting machine-tool builders. Skilled machinists are still very scarce and it is difficult in many instances, to make prompt deliveries. New business is of good proportions, although present demand is hardly as active as a month or two ago. Inquiry is also good and it is believed that sufficient new business will develop to sustain the high rate of production well into the new year. Many lines are represented in current bookings.

National Enameling & Stamping Co., 909 St. Paul Avenue, Milwaukee, is reconstructing a two-story building, 57 x 110 ft., into a manufacturing addition at an estimated cost of \$45,000, including equipment. Siebert & Kegler, 230 Wisconsin Avenue, local, are architects.

People's Ice & Fuel Co., Second and

Division Streets, LaCrosse, Wis., is having plans made for a new artificial ice plant and storage house with daily capacity of 150 tons. Work will begin shortly after Jan. 1. New ice and refrigerating machinery, engines, etc., will be required.

Gugler Lithographic Co., 687 Milwaukee Street, Milwaukee, has plans by Eric Gugler, architect, 101 Park Avenue, New York, for six additional stories, 60 x 123 ft., on two-story building. New press equipment, motors, two elevators are among requirements. Construction work will begin about Dec. 1.

Federal Rubber Co., Cudahy, has placed general contract with Thomas Siderits Construction Co., 306 North Avenue, Milwaukee, for a one-story manufacturing addition to cost about \$85,000.

Hicks Printing Co., Otter and State Streets, Oshkosh, Wis., publisher of *Daily Northwestern*, has engaged Auler & Jensen, local architects, to design its new plant to cost about \$135,000. It is expected to start work about Jan. 15. Oscar J. Hardy is president.

Edgar T. Ward's Sons Co. has completed a new warehouse at Milwaukee in West Allis manufacturing district. Fred O'Dell is in charge as branch manager.

## Foreign

OFFICIALS of Allmanna Svenska Elektriska A. B., Vasteras, Sweden, manufacturer of electrical machinery,

have formed Svenska Elektrokonsessionen, a subsidiary, with capital of 10,000,000 krona (about \$2,500,000), to take over and expand a plant at Yaroslav, Russia, to manufacture electric equipment, to operate under an agreement between parent company and Soviet Russian Government.

Ilseider Steel Corporation (Ilseider Hutte), Berlin Germany, manufacturer of structural shapes and other steel products, is disposing of a bond issue of \$10,000,000 in United States, part of proceeds to be used for extensions and improvements. J. Fromme and Ewald Hecker are managing directors.

Department of Public Works, Lima, Peru, has approved construction of new railroad from Yurimaguas east to Pacific Ocean, to cost \$30,000,000 with car and locomotive shops, signal systems, rolling stock, etc.

Officials of Victor Talking Machine Co., Camden, N. J., have organized Victor Talking Machine Co. of Chile, Inc., a subsidiary, with capital of \$208,000, to construct and operate a new plant in Chile.

International Telephone & Telegraph Corporation, 67 Broad Street, New York, has secured a concession from Government of Chile for its recently formed subsidiary, Compania Internacional de Radio, to construct and operate radio receiving and broadcasting stations in that country and other plants and facilities for international wireless service, telegraph and telephone.

## New Trade Publications

**Nickel Steel.**—International Nickel Co., New York. A 12-page pamphlet describing the use of nickel steel in the "Wasp" and "Hornet" aircraft engines built by the Pratt & Whitney Co., Hartford, Conn. Is fully illustrated.

**Semi-Diesel Oil Engines.**—Chicago Pneumatic Tool Co., 6 East Forty-fourth Street, New York. Bulletin 773 of 12 pages illustrates and describes a class of horizontal straight-line oil engines of 30 to 100 b.h.p. Details of construction are shown, and some sectional views.

**Blowers and Gas Pumps.**—Connersville Blower Co., Connersville, Ind. Bulletin 25 of six pages illustrates and describes rotary positive blowers with capacities from 400 to 15,000 cu. ft. a minute and pressures up to 12 lb. on the sq. in.

**Wedge Nuts.**—Crouse-Hinds Co., Syracuse, N. Y. Bulletin 2114 of eight pages shows a method of attaching electrical and other fixtures by means of a wedge nut pulled tight by the action of the bolt.

**Design of Welded Machine Parts.**—Lincoln Electric Co., Cleveland. 32-page supplement to the booklet "Arc Welding" giving pointers on how to begin the application of welding in manufacturing machines and equipment.

**Long-Distance Transmitting and Recording.**—Bristol Co., Waterbury, Conn. Catalog 1900 of 24 pages is accompanied by price list of six pages. It illustrates and describes equipment for centralized control with electrical transmitting and recording equipment, depicting conditions at one or more

distant points. The system operates on the induction balance principle, which is explained in the catalog.

**Seamless Steel Tubes.**—Pittsburgh Steel Products Co., Pittsburgh. Booklet of 16 pages, "A Quarter Century of Progress," tells the story of steel tubes made by the seamless process to the extent of about 20,000 tons a month. The list of uses runs to about 140 in number.

**Centrifugal Pumps.**—Aldrich Pump Co., Allentown, Pa. Data No. 71 of 12 pages show a number of types of multi-stage single-suction centrifugal pumps, with performance curves and specifications. Both sectional and installation views are given.

**Rolled Anodes.**—Taunton-New Bedford Copper Co., Taunton, Mass. Four-page folder describing Eagle brand flat and curved anodes for a variety of purposes, and setting forth their advantages.

**Handy Book of Silver Solder.**—Handy & Harmon, 57 William Street, New York. 20-page booklet describing the properties of twelve commercial silver solders, their uses in fabricating copper, brass, monel, stainless, and sterling articles, and the technique of soldering.

**Electric Heat in General Electric Factories.**—General Electric Co., Schenectady, N. Y. A handsome 32-page booklet describing 25 different classes of furnaces, ovens and melting pots used in the manufacture of electrical machinery and devices, all using current for the heating medium. Perhaps the largest is a car-type annealing furnace 28 x 16 x 9 ft., and the smallest is a glue pot.



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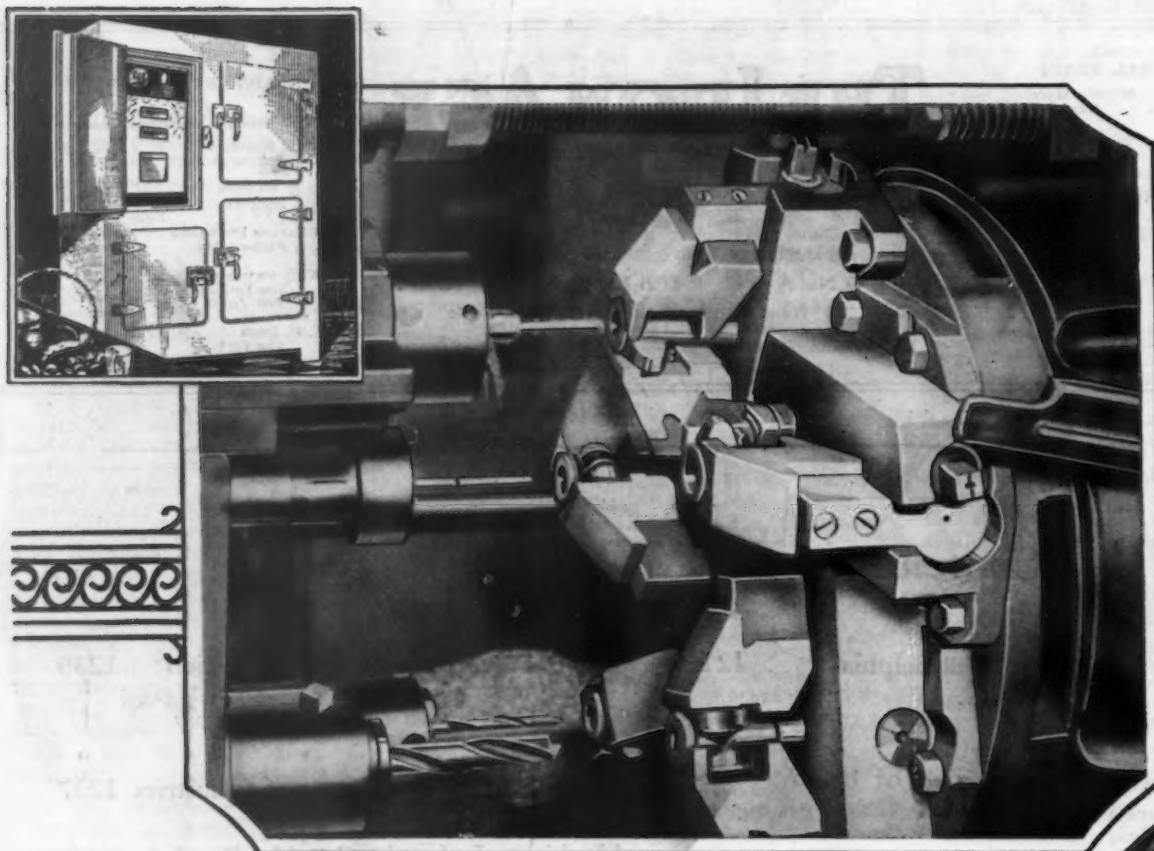
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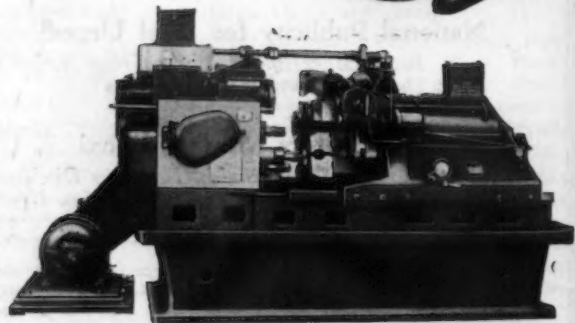
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